

ENGLISH

NCERT COMPLETE REVISION

NCR

Pre-Medical : Biology

Class XI



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NCR BIOLOGY (CLASS-XI)



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DIVERSITY OF THE LIVING WORLD

Q.No.	Question	Answer
1.	Increase in mass and increase in number of individuals are twin characteristics of which character of living organisms?	Growth
2.	Growth, reproduction, ability to sense environment are the features of living organisms. (True/False)	True
3.	Who was the Darwin of 20 th century ?	E. Mayr
4.	The biggest spin off of taxonomic studies was the recognition of sharing of similarities among living organisms both 'A' and 'B'.	A-Horizontally B-Vertically
5.	Early man could easily perceive the difference between inanimate matter and living organisms. (True/False)	True
6.	In majority of higher animals and plants, growth and reproduction are mutually exclusive events. (True/False)	True
7.	What is the common method for multiplication among the fungi, filamentous algae and protonema of mosses ?	Fragmentation
8.	Reproduction can not be taken as defining characteristics of living organisms. Why ?	There are many organisms those cannot reproduce
9.	For unicellular organisms like bacteria, unicellular algae and <i>Amoeba</i> , 'A' is synonymous with 'B'.	A-Reproduction B-Growth
10.	Growth can not be taken as defining characteristic of living organisms. Why ?	Because non-living objects also grow by accumulation of materials on surface.
11.	Properties of tissues are not present in the constituent cells but arise as a result of interactions among the constituent cells. (True/False)	True
12.	The sum total of all chemical reactions occurring in a living body is called ?	Metabolism
13.	What is the most obvious and technically complicated feature of all living organisms ?	Consciousness
14.	The patient is brain-dead and has no self-consciousness. Such patients are never come back to normal life. They are considered living or non-living.	Living
15.	<u>A</u> affects reproduction in seasonal breeders, both plants and animals	A-Photoperiod
16.	In Binomial nomenclature, each name has two components the <u>A</u> and the <u>B</u> .	A-Generic name B-Specific epithet
17.	What is the full form of ICBN ?	International Code of Botanical Nomenclature
18.	How many species are known and described till now ?	1.7-1.8 million
19.	The number and types of organisms present on earth, this refers to as ?	Biodiversity
20.	For plants, scientific names are based on agreed principles and criteria, which are provided by ?	ICBN
21.	Both the words in a biological name, when handwritten, are separately underlined, or printed in italics to indicate _____.	Their Latin origin
22.	Biological names are generally in <u>A</u> language and written in <u>B</u> .	A-Latin, B-Italics
23.	All living organisms can be classified into different taxa on the basis of characteristics, this process is called ?	Classification
E		

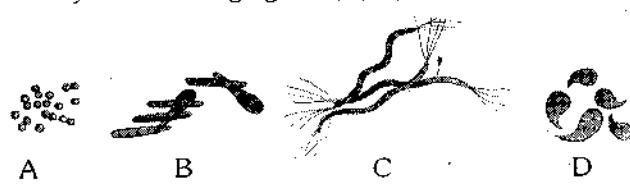
24.	According to binomial system, how the first letter of first word and first letter of second word in name of an organism are written respectively ?	Capital and Small
25.	What is Alsatians ?	A variety of Dog species or breed.
26.	The word systematics is derived from the Latin word 'Systema' which means ?	Systematic arrangement of organisms
27.	Taxonomic categories / taxonomic groups are distinct biological entities and not merely morphological aggregates. (True/False)	True
28.	What are basics of taxonomy ?	Identification Nomenclature Classification
29.	The earliest classifications were based on the _____ of various organisms.	Uses or economic importance
30.	Genus comprises a group of related species which has more characters in common in comparison to species of other genera. (True/False)	True
31.	Felidae and <i>Felis</i> represent which taxonomic categories respectively?	Family, Genus
32.	Write the scientific names of :- (A) Human (B) Potato (C) Leopard	A- <i>Homo sapiens</i> B- <i>Solanum tuberosum</i> C- <i>Panthera pardus</i>
33.	<i>Solanum</i> , <i>Petunia</i> and <i>Datura</i> are the genera, belong to which family ?	Solanaceae
34.	A group of individual organisms with fundamental morphological similarities is called ?	Species
35.	Order and other higher taxonomic categories are identified based on the aggregation of characters. (True/False)	True
36.	Fishes, amphibians, reptiles, birds along with mammals constitute the next higher category called ?	Phylum (Chordata)
37.	As we go higher from species to kingdom then what will happen to the number of common characteristics ?	They will decrease
38.	The following sequence shows taxonomic categories in ascending order : Kingdom ← Phylum ← B ← Order ← A ← Genus ← Species What are A and B in this sequence	A-Family B-Class
39.	Find the odd one from followings :- Chordata, Carnivora, <i>Solanum</i> , Mammalia	<i>Solanum</i>
40.	Higher the category, greater is the difficulty of determining the relationship to other taxa at the same level. Why ?	Because common characters are less
41.	Match the column (I & II) Column I (A) Man (B) Housefly (C) Mango (D) Wheat	Column II (i) <i>Mangifera indica</i> (ii) <i>Triticum aestivum</i> (iii) <i>Homo sapiens</i> (iv) <i>Musca domestica</i>
2		

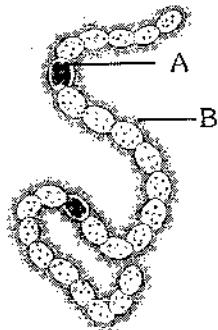
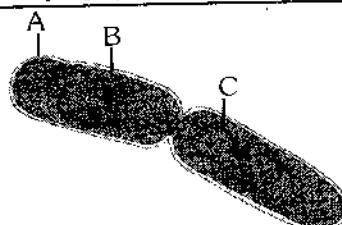
42.	Find out the odd one :- Sapindales, Anacardiaceae, Poales	Anacardiaceae
43.	Identify A & B :- <i>Triticum aestivum</i> → <i>Triticum</i> → A → Poales → B → Angiospermae	A - Poaceae B - Monocotyledonae
44.	_____ is a store house of collected plant specimens that are dried, pressed and preserved on sheets.	Herbarium
45.	Herbarium serves as quick referral system in taxonomic studies. (True/False)	True
46.	Indian Botanical Garden (IBG) and National Botanical Garden (NBG) are situated at ?	IBG-Howrah NBG-Lucknow
47.	What is the main purpose of botanical garden ?	Identification of plants
48.	Which taxonomical aid uses living plant forms for studies ?	Botanical Garden
49.	Name the taxonomical aid which is used for study and reference of both plant and animal specimens.	Biological Museum
50.	Name the taxonomical aid where wild animals are kept in protected environments under human care.	Zoological parks
51.	What is the main aim of zoological parks ?	Learn about food habits & behaviour of wild animals
52.	In keys, a pair of contrasting characters is called ?	Couplet
53.	Couplet represents the choice made between two opposite options. This results in acceptance of only one and rejection of the other. (True/False)	True
54.	Each statement of couplet in the key is called _____.	Lead
55.	What does monograph contain ?	Informations on any one taxon
56.	Which contains the actual account of habitat and distribution of plants of a given area ?	Flora
57.	Taxonomical aid which is useful in providing information for identification of names of species found in an area.	Manuals
58.	Taxonomists prepare and disseminate information through A and B.	A-Manuals B-Monographs
59.	The taxonomic studies of various species of plants and animals are useful in agriculture, forestry, industry and in general for knowing our bio-resources and their diversity. (True/False)	True
60.	Who gave two kingdom system ?	Carolus Linnaeus
61.	Two kingdom system did not distinguish between the eukaryotes and prokaryotes, unicellular and multicellular organisms and photosynthetic (Autotrophs) and non-photosynthetic (Heterotrophs) organisms. These are demerits of two kingdom system. (True/False)	True
62.	Aristotle used simple morphological characters to classify plants into A, B and C.	A-trees, B-shrubs, C-herbs
63.	Though A and B kingdoms have been a constant under all different systems, the understanding of what group organisms be included under these kingdoms have been changing the C and D of other kingdom have also been understood differently by different scientists over time.	A-Plants B-Animals C-Number D-Nature
E		

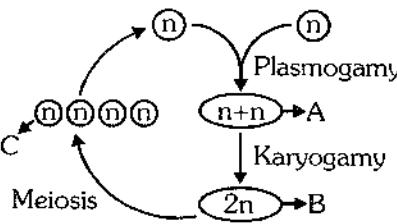
Characters	Five Kingdom				
	Monera	Protista	A	Plantae	Animalia
Cell type	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	Noncellular (Polysaccharide + amino acid)	Present in some	Present (without cellulose)	Present (cellulose)	Absent
Nuclear membrane	Absent	Present	Present	Present	B
Body organisation	Cellular	C	Multicellular /loose tissue	Tissue/ organ	Tissue/ organ/ organ system
D	Autotrophic (chemosynthetic and photosynthetic) and Heterotrophic (saprophytic/ parasite)	Autotrophic (Photosynthetic) and Heterotrophic	Heterotrophic (Saprophytic/ Parasitic)	Autotrophic (Photosynthetic)	Heterotrophic (Holozoic/ Saprophytic etc.)

Observe the above table and answer the following questions
(64 to 68)

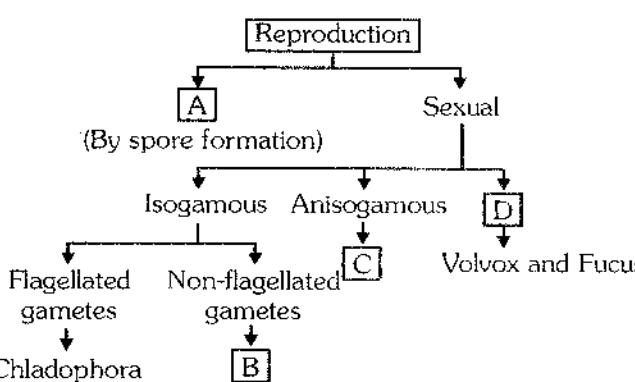
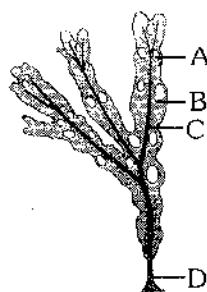
64.	Identify the A, B, C and D.	A-Fungi, B-Present, C-Cellular, D-Mode of nutrition
65.	How many kingdoms include producers and name these kingdoms ?	Three; Monera, Protista, Plantae
66.	In which kingdom unicellular, eukaryotic autotrophic organisms are placed ?	Protista
67.	In how many kingdom cellulosic cell walled organisms are present ?	Two- Protista, Plantae
68.	From above table, how many characters are uncommon between fungi and plantae ?	Cell wall, Mode of Nutrition, Body organisation
69.	On the basis of shape, how many groups of bacteria are formed and what are their names ?	Four Coccus, Bacillus, Vibrium, Spirillum
70.	The criteria for classification are changing over time. Why ?	Because the improvement in our understanding of characters
71.	All <u>A</u> organisms are grouped under kingdom monera and unicellular eukaryotes are placed in kingdom <u>B</u> .	A-Prokaryotic B-Protista
72.	<i>Chlamydomonas</i> and <i>Amoeba</i> are classified in kingdom protista according to Whittaker's classification system but by earlier classification system both these organisms are classified in different kingdoms. (True/False)	True
73.	Identify the following figures (A, B, C and D)	A-Cocci B-Bacilli C-Spirillia D-Vibrio

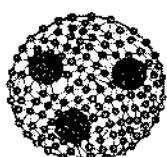
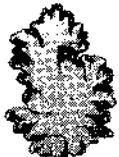


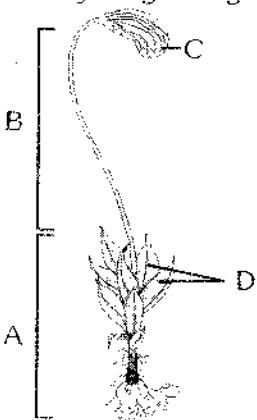
74.	<p>Identify the following figure with structure A and B and write their functions :-</p> 	<p>A-Nostoc, Heterocyst Function - Nitrogen fixation B-Mucilagenous sheath Function - Protection from water</p>
75.	The bacterial structure is very <u>A</u> , they are very complex in <u>B</u> .	A-Simple, B-Behaviour
76.	The vast majority of bacteria are heterotrophs. (True/False)	True
77.	<p>Read the following statements :-</p> <p>(A) Found in the gut of ruminants (B) Complex cell wall structure (C) Survive in marshy habitats</p> <p>Above statements are related to :- which are Archaebacteria</p>	Methanogens
78.	Compared to many other organisms, which group show the most extensive metabolic diversity ?	Bacteria
79.	Which organism are the smallest living cells known and can survive without oxygen ?	Mycoplasma
80.	Cholera, Typhoid, Tetanus, Citrus canker are well known diseases caused by :	Bacteria
81.	In which kingdom, Chrysophytes, Dinoflagellates, Euglenoids, Slime moulds and Protozoans are included ?	Protista
82.	Chrysophytes which are the chief producers in the ocean?	Diatoms
83.	 <p>Identify the above process in bacteria and identify part A, B & C :</p>	Process : Binary Fission <p>A-Cell wall B-Cell membrane C-DNA</p>
84.	 <p>Identify the above organism :-</p>	Euglena
85.	Which protist possesses two flagella one lies longitudinal and other transversely ?	Dinoflagellates
86.	<p>Read the following points regarding protist :-</p> <p>(A) Saprophytic nature (B) Spores with true wall (C) Wall less vegetative phase</p> <p>Above organism should be :-</p>	Slime moulds

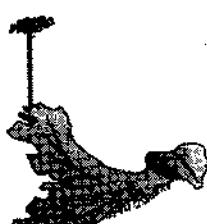
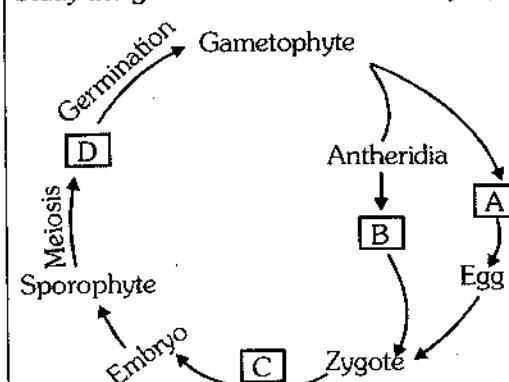
87.	Euglenoids have a protein rich layer called _____ which makes their body flexible.	Pellicle												
88.	_____ are primitive relative of animals.	Protozoans												
89.	Which organism are used to make bread and beer ?	Yeast												
90.	Some hyphae are continuous tubes filled with multinucleated cytoplasm, these are called:-	Coenocytic hyphae												
91.	The cell walls of fungi are composed of	Chitin and Polysaccharides												
92.	Fungi prefer to grow :-	Warm & Humid places												
93.	Write the name of three steps of sexual reproduction in fungi :-	1-Plasmogamy 2-Karyogamy 3-Meiosis												
94.	Identify the following figure :- 	<i>Agaricus</i>												
95.	By which basis kingdom-Fungi is divided into various classes ?	Morphology of mycelium Mode of spore formation and fruiting bodies												
96.	Identify the A, B and C in the given line diagram :- 	A-Dikaryon B-Synkaryon C-Spores												
97.	Members of which fungal class are found in aquatic habitats and on decaying wood in moist and damp places or as obligate parasites.	Phycomycetes												
98.	Which fungus is used extensively in bio-chemical & genetic works?	<i>Neurospora</i>												
99.	The basidiospores are <u>A</u> produced on the <u>B</u> .	A-exogenously B-Basidium												
100.	Identify the A, B and C in the following table :- <table border="1" data-bbox="293 1717 833 1919"> <thead> <tr> <th>Class</th> <th>Member</th> <th>Disease</th> </tr> </thead> <tbody> <tr> <td>Ascomycetes</td> <td>A</td> <td>Ergot</td> </tr> <tr> <td>Basidiomycetes</td> <td><i>Puccinia</i></td> <td>B</td> </tr> <tr> <td>C</td> <td><i>Alternaria</i></td> <td>Blight</td> </tr> </tbody> </table>	Class	Member	Disease	Ascomycetes	A	Ergot	Basidiomycetes	<i>Puccinia</i>	B	C	<i>Alternaria</i>	Blight	A- <i>Claviceps</i> B-Rust C-Deuteromycetes
Class	Member	Disease												
Ascomycetes	A	Ergot												
Basidiomycetes	<i>Puccinia</i>	B												
C	<i>Alternaria</i>	Blight												
101.	Mushroom, Bracket fungi & smut fungi belong to which fungal class?	Basidiomycetes												
102.	Most of the members of fungal class _____ are decomposers of litter and help in mineral cycling.	Deuteromycetes												

103.	Life cycle of plants has two distinct phases - the diploid <u>A</u> and the <u>B</u> gametophyte.	A-Sporophyte, B-Haploid
104.	All of us who have suffered the ill effects of common cold or 'flu'. It is caused by	Viruses
105.	Which kingdom is characterized by heterotrophic, eukaryotic organisms that are multicellular and their cells lack cell wall?	Kingdom - Animalia
106.	Bladderwort and venus fly trap are example of <u>A</u> plant and Cuscuta is a <u>B</u> plant.	A-Insectivorous B-Parasitic
107.	Identify the following figure with A, B, C and D :-	Bacteriophage A-Head B-Collar C-Sheath D-Tail fibres
108.	Who called <i>contagium vivum fluidum</i> and what does it stand for ?	M.W. Beijerinck Infectious living fluid
109.	Read the following symptoms :- <ul style="list-style-type: none"> • Mosaic formation • Leaf rolling and curling • Yellowing and vein clearing • Dwarfing Above symptoms are due to infection of	Viruses
110.	Identify the following figure and A & B :-	Tobacco mosaic virus (TMV) A-RNA B-Capsid
111.	Who said that viruses are smaller than bacteria ?	D.J. Ivanowsky
112.	In lichens, the algal component is known as <u>A</u> and the fungal component as <u>B</u> .	A-Phycobiont B-Mycobiont
113.	Identify the infectious agent on the basis of given informations :- <ul style="list-style-type: none"> • Discoverer T.O. Diener • Smaller than viruses • Low molecular weight RNA • Absence of protein coat 	Viroids
114.	The causative agent of potato spindle tuber disease is composed of	Only RNA

115.	Identify the group of organisms, on the basis of given informations <ul style="list-style-type: none"> • Show symbiotic association • Very good pollution indicator • Pioneer to barren rocks 	- Lichen										
116.	In lichens, <u>A</u> prepare food for <u>B</u> and fungi provide shelter and absorb <u>C</u> for its partner.	A-Algae B-Fungi C-Water and mineral										
117.	Which taxonomy is based on following points :- <ul style="list-style-type: none"> • chromosome number • chromosome structure • chromosome behavior 	Cytotaxonomy										
118.	Match the column I with column II :- <table> <thead> <tr> <th>Column I</th> <th>Column II</th> </tr> </thead> <tbody> <tr> <td>(A) Unicellular</td> <td>(i) <i>Spirogyra</i></td> </tr> <tr> <td>(B) Colonial</td> <td>(ii) Kelps</td> </tr> <tr> <td>(C) Filamentous</td> <td>(iii) <i>Volvox</i></td> </tr> <tr> <td>(D) Massive plant bodies</td> <td>(iv) <i>Chlamydomonas</i></td> </tr> </tbody> </table>	Column I	Column II	(A) Unicellular	(i) <i>Spirogyra</i>	(B) Colonial	(ii) Kelps	(C) Filamentous	(iii) <i>Volvox</i>	(D) Massive plant bodies	(iv) <i>Chlamydomonas</i>	A-iv, B-iii, C-i, D-ii
Column I	Column II											
(A) Unicellular	(i) <i>Spirogyra</i>											
(B) Colonial	(ii) Kelps											
(C) Filamentous	(iii) <i>Volvox</i>											
(D) Massive plant bodies	(iv) <i>Chlamydomonas</i>											
119.	Identify A, B, C and D in given flow chart :-  <pre> graph TD A[Reproduction] --> B[Sexual] A --> C[By spore formation] C --> D[Isogamous] C --> E[Anisogamous] D --> F[Flagellated gametes] D --> G[Non-flagellated gametes] E --> H[Volvox and Fucus] F --> I[Chladophora] G --> J[B] </pre>	A-Asexual B- <i>Spirogyra</i> C- <i>Chlamydomonas braunii</i> D-Oogamous										
120.	Numerical taxonomy which is now easily carried out using computers is based on _____	All observable characteristics										
121.	Which type of sexual reproduction is found in <i>Fucus</i> ?	Oogamous										
122.	Identify the given figure with A, B, C & D :- 	<i>Fucus</i> A-Air bladder B-Frond C-Mid rib D-Holdfast										

123.	Identify the given figures (A, B, C) :-	A- <i>Volvox</i> B- <i>Chlamydomonas</i> C- <i>Chara</i>												
	 (A)  (B)  (C)													
124.	Write down the algal class of following figures :-	A-Chlorophyceae B-Phaeophyceae C-Rhodophyceae												
	 (A)  (B)  (C)													
125.	Study the following table and identify (i) (ii) & (iii) :-	(i) <i>Laminaria</i> (ii) Red algae (iii) <i>Chara</i>												
	<table border="1" data-bbox="285 987 770 1492"> <thead> <tr> <th>Figure</th> <th>Algal Group</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td></td> <td>Brown algae</td> <td>(i)</td> </tr> <tr> <td></td> <td>(ii)</td> <td><i>Polysiphonia</i></td> </tr> <tr> <td></td> <td>Green algae</td> <td>(iii)</td> </tr> </tbody> </table>	Figure	Algal Group	Name		Brown algae	(i)		(ii)	<i>Polysiphonia</i>		Green algae	(iii)	
Figure	Algal Group	Name												
	Brown algae	(i)												
	(ii)	<i>Polysiphonia</i>												
	Green algae	(iii)												
126.	<i>Porphyra</i> & <i>Dictyota</i> are belonged to which algal class respectively	Rhodophyceae, Phalophyceae												
127.	Agar, one of the commercial products obtained from <u>A</u> and <i>Gracilaria</i> are used to grow microbes and in preparations of ice-creams and jellies.	A- <i>Gelidium</i>												
128.	Which are the pigments found in phaeophyceae ?	Chlorophyll-a,c, Fucoxanthin												
129.	Write the name of two unicellular algae which are rich in proteins and are used as food supplements :-	<i>Chlorella</i> <i>Spirulina</i>												
130.	Most of the green algae have one or more storage bodies, which are located in the chloroplasts are called :-	Pyrenoids												
131.	Certain marine brown and red algae produce large amounts of hydrocolloids eg. <u>A</u> and <u>B</u> , respectively which are used commercially.	A-Algin B-Carrageen												

132.	<p>Identify A, B & C in given table :-</p> <table border="1"> <thead> <tr> <th>Class</th><th>Major Pigments</th><th>Stored Food</th></tr> </thead> <tbody> <tr> <td>Chlorophyceae</td><td>A</td><td>Starch</td></tr> <tr> <td>B</td><td>Chl. a, c</td><td>Mannitol Laminarian</td></tr> <tr> <td>Rhodophyceae</td><td>Chl. a, d</td><td>C</td></tr> </tbody> </table>	Class	Major Pigments	Stored Food	Chlorophyceae	A	Starch	B	Chl. a, c	Mannitol Laminarian	Rhodophyceae	Chl. a, d	C	<p>A-Chlorophyll a, b B-Phaeophyceae C-Floridean starch</p>
Class	Major Pigments	Stored Food												
Chlorophyceae	A	Starch												
B	Chl. a, c	Mannitol Laminarian												
Rhodophyceae	Chl. a, d	C												
133.	In phaeophyceae, the vegetative cells have a cellulosic cell wall usually covered on the outside by a gelatinous coating of _____.	Algin												
134.	Why are the members of Rhodophyceae commonly called red algae?	Due to pre-dominance of r-phycoerythrin												
135.	Floridean starch is similar to <u>A</u> and glycogen in structure.	A-Amylopectin												
136.	In which class of algae, gametes are pyriform (pear-shaped) and bear two unequal laterally attached flagella ?	Phaeophyceae												
137.	In which class of algae sexual reproduction is oogamous and accompanied by complex post fertilization developments ?	Rhodophyceae												
138.	<p>Identify the given figure with A, B, C & D :-</p> 	<p><i>Funaria</i> A-Gametophyte B-Sporophyte C-Capsule D-Leaves</p>												
139.	<i>Gracilaria</i> and <i>Porphyra</i> are the members of which algae class ?	Rhodophyceae												
140.	Identify the given figure and also identify the part which produce specialised asexual reproductive structures ?	<i>Marchantia</i> , Gemma cup												
														

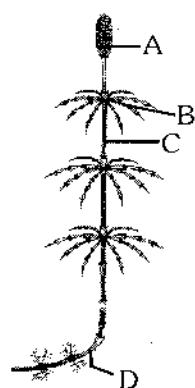
141.	Identify the plants in figures (A & B)	A-Marchantia (Dioecious) B-Sphagnum (Monoecious)						
	 A  B							
142.	Bryophytes are called amphibians of the plant kingdom. Why ?	Because they can live in the soil but depend on water for sexual reproduction						
143.	Study the given flow chart and identify A, B, C & D :-	A-Archeogonia B-Antherozoids C-Mitosis D-Spores						
								
144.	In liverworts, <u>A</u> are green, multicellular, asexual buds, which develop in small receptacles called <u>B</u> located on thallus :-	A-Gemmae B-Gemma cups						
145.	In bryophytes, zygotes do not undergo reduction division immediately. (True/False)	True						
146.	Find the ploidy level of followings with respect to bryophytes :- A-Gametophyte B-Sporophyte C-Spore D-Antherozoids E-Gemmae F-Rhizoids	A-n B-2n C-n D-n E-n F-n						
147.	The moss gametophyte consists of two predominant stages, what they are, and they develop from ?	<table border="1"> <thead> <tr> <th>Stages</th> <th>Develop from</th> </tr> </thead> <tbody> <tr> <td>Protonema</td> <td>Spore</td> </tr> <tr> <td>Leafy gametophyte</td> <td>Bud</td> </tr> </tbody> </table>	Stages	Develop from	Protonema	Spore	Leafy gametophyte	Bud
Stages	Develop from							
Protonema	Spore							
Leafy gametophyte	Bud							
148.	In bryophytes, the dominant phase in the life cycle is the _____ plant body but in pteridophytes, the main plant body is _____	Gametophytic Sporophytic						
149.	Which of the following term is not related with mosses ? Capsule, Buds, Prothallus, Rhizoids, Archegonia, Protonema	Prothallus						
150.	Which part of gametophytic plant body of a moss bears sex organs-antheridia & archegonia?	At the apex of the leafy shoots						

151. Identify the following figure :-



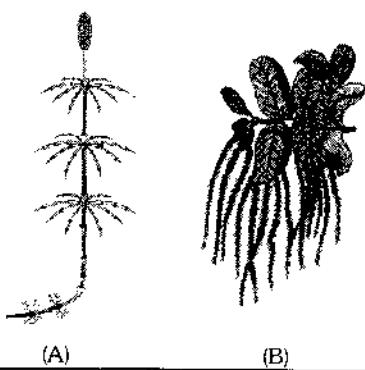
Selaginella

152. Label the A, B, C & D in given figure :-



A-Strobilus
B-Node
C-Internode
D-Rhizome

153. Identify the following figures (A & B) :-

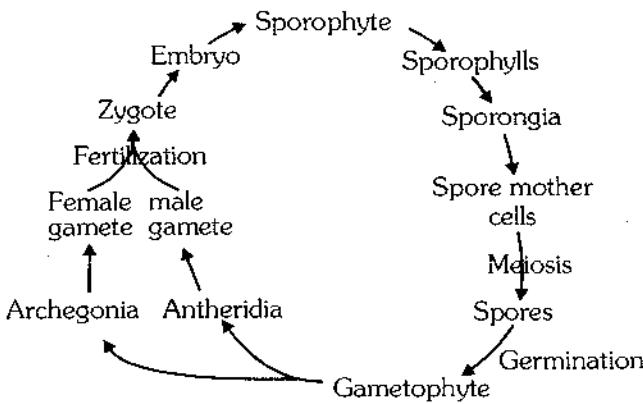


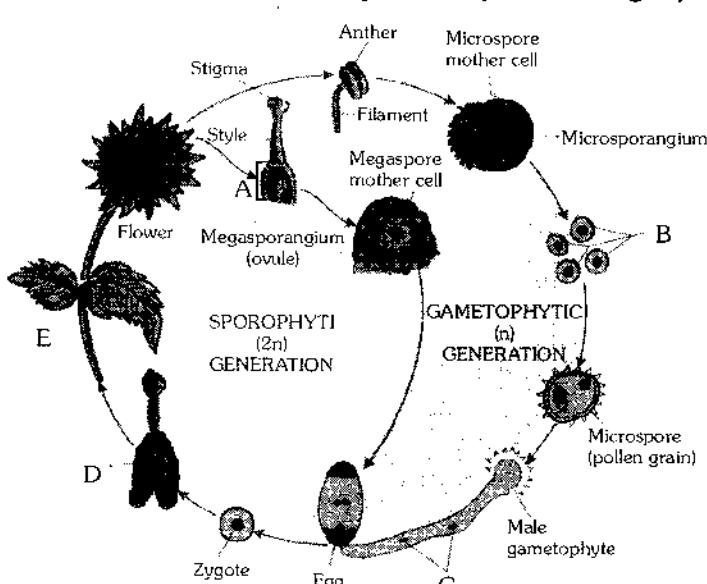
A-*Equisetum*
B-*Salvinia*

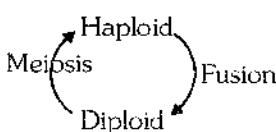
154. Match the column I with column II :-

Column I (Figure)	Column II (Class)
(A)	(i) Sphenopsida
(B)	(ii) Pteropsida
(C)	(iii) Lycopsida

A-iii
B-i
C-ii

155.	How many of the following have heterosporous nature ? <i>Selaginella, Equisetum, Salvinia</i>	Two (<i>Selaginella, Salvinia</i>)																
156.	Study the following life cycle of <i>Pteridophytes</i> :-  How many structures represent gametophytic & sporophytic generations, respectively ?	Gametophytic structures = Six [Spore, Gametophyte, antheridia, archegonia, male gamete and female gamete] Sporophytic structures = Six [Zygote, embryo, sporophyte, sporophylls, sporangia and spore mother cells]																
157.	Read the following informations and identify the genus :- •Coralloid roots are with BGA •Unbranched stem •Lack ovary wall •Pinnate leaves	<i>Cycas</i>																
158.	Match the column I with column II :- <table border="1" data-bbox="293 1144 865 1358"> <thead> <tr> <th colspan="2">Column I</th> <th colspan="2">Column II</th> </tr> </thead> <tbody> <tr> <td>(A)</td> <td><i>Pinus</i></td> <td>(i)</td> <td>Precursor of seed habit</td> </tr> <tr> <td>(B)</td> <td><i>Cycas</i></td> <td>(ii)</td> <td>Coralloid roots</td> </tr> <tr> <td>(C)</td> <td><i>Selaginella</i></td> <td>(iii)</td> <td>Mycorrhizal association</td> </tr> </tbody> </table>	Column I		Column II		(A)	<i>Pinus</i>	(i)	Precursor of seed habit	(B)	<i>Cycas</i>	(ii)	Coralloid roots	(C)	<i>Selaginella</i>	(iii)	Mycorrhizal association	A-iii, B-ii, C-i
Column I		Column II																
(A)	<i>Pinus</i>	(i)	Precursor of seed habit															
(B)	<i>Cycas</i>	(ii)	Coralloid roots															
(C)	<i>Selaginella</i>	(iii)	Mycorrhizal association															
159.	The spread of living pteridophytes is limited and restricted to narrow geographical regions. why ?	because they need water for fertilization																
160.	Female cone → Mega sporophylls → Megasporangia → Megaspores For above terms, which one is related to <i>Pinus</i> but not related to <i>Cycas</i> ?	Female cone																
161.	Identify the name of processes (A & B) in the given sequence :- Microspore mother cell \xrightarrow{A} Microspore \xrightarrow{B} Male gametophyte	A-Meiosis B-Germination																
162.	In gymnosperms, the male and the female gametophytes do not have an independent free-living existence. (True/False)	True																
163.	In gymnosperms, the nucellus is protected by envelopes and the composite structure is called ?	Ovule																
164.	How many following cells are present in an embryo sac :- A - Egg cell B - Synergids C - Antipodal D - Central cell	A-1 B-2 C-3 D-1																

165.	Write the names of male and female sex organs of angiosperms respectively :-	Stamen Carpel or Pistil
166.	In how many classes angiosperms are divided ?	Two (Dicotyledonae and monocotyledonae)
167.	Ovules, stamen, ovary, carpel, anther, antipodals, synergids, pollen grains How many structures are NOT produced by female plant of angiosperm ?	Three Stamen Anther Pollen grains
168.	Angiosperms range in size from tiny, almost microscopic e.g. <u>A</u> to tall trees of e.g. <u>B</u> .	A- <i>Wolfia</i> B- <i>Eucalyptus</i>
169.	How many nuclei are involved in double fertilization ?	Five [2 male nuclei, 2 polar nuclei, 1 egg nucleus]
170.	Write down the ploidy level of followings regarding typical angiosperm :- (A) Endosperm (B) Synergids (C) Embryo (D) Pollen grain (E) Embryosac	A-3n, B-n, C-2n, D-n, E-n
171.	After fertilization, what is the future of the following :- (A) Ovule (B) Synergids (C) Ovary (D) Antipodals	A-Seed B-Degenerate C-Fruit D-Degenerate
172.	Identify the A, B, C, D & E in given life cycle of an angiosperm :-	A-Ovary B-Microspore C-Male gametes D-Embryo E-Sporophyte
		
173.	Many algae such as <i>Volvox</i> , <i>Spirogyra</i> and some species of <i>Chlamydomonas</i> represent _____ pattern of life cycle.	Haplontic
174.	Which kind of life cycle pattern is shown by all seed-bearing plants ?	Diplontic
175.	The life cycle of any sexually reproducing plant, there is an alternation of generation between <u>A</u> producing by haploid gametophyte and <u>B</u> producing by diploid Sporophyte.	A-Gametes B-Spore

176.	Which processes are essential for alternation of generation in plant life cycle ?	 Meiosis and fusion of gametes															
177.	In bryophytes, what is the dominant phase of life cycle ?	Gametophytic phase															
178.	<p>"The diploid sporophyte is represented by a dominant, independent, photosynthetic, vascular plant body. It alternates with multicellular saprophytic/autotrophic, independent but short-lived haploid gametophytes"</p> <p>Above pattern of life cycle is represented by which group of plants?</p>	Pteridophyta															
179.	<p>"The short-lived multicellular sporophyte totally or partially dependent on the gametophyte"</p> <p>Above statement is related to which group of kingdom plantae ?</p>	Bryophyta															
180.	Which type of life cycle is found in <i>Fucus</i> ?	Diplontic															
181.	<p>Algae usually reproduce vegetatively by <u>A</u>, asexually by formation of <u>B</u> and sexually by fusion of <u>C</u>.</p>	<p>A-Fragmentation B-Spores C-Gametes</p>															
182.	Match the column (Process) with column II (Result)	<table border="0"> <thead> <tr> <th data-bbox="287 1158 763 1192">Column I</th> <th data-bbox="779 1158 906 1192">Column II</th> <th></th> </tr> </thead> <tbody> <tr> <td data-bbox="287 1203 716 1236">(A) Fusion of male & female gametes</td> <td data-bbox="779 1203 890 1236">(i) Spores</td> <td data-bbox="1089 1203 1137 1236">A-ii</td> </tr> <tr> <td data-bbox="287 1248 525 1281">(B) Mitosis in zygote</td> <td data-bbox="779 1248 890 1281">(ii) Zygote</td> <td data-bbox="1089 1248 1137 1281">B-iv</td> </tr> <tr> <td data-bbox="287 1293 589 1326">(C) Meiosis in sporophyte</td> <td data-bbox="779 1293 970 1326">(iii) Gametophyte</td> <td data-bbox="1089 1293 1137 1326">C-i</td> </tr> <tr> <td data-bbox="287 1338 589 1371">(D) Germination of spores</td> <td data-bbox="779 1338 906 1371">(iv) Embryo</td> <td data-bbox="1089 1338 1137 1371">D-iii</td> </tr> </tbody> </table>	Column I	Column II		(A) Fusion of male & female gametes	(i) Spores	A-ii	(B) Mitosis in zygote	(ii) Zygote	B-iv	(C) Meiosis in sporophyte	(iii) Gametophyte	C-i	(D) Germination of spores	(iv) Embryo	D-iii
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(D) Germination of spores	(iv) Embryo	D-iii															

ANIMAL KINGDOM

Q.No.	Question	Answer
1.	Members of which phylum are commonly known as sponges ?	Porifera
2.	Which type of symmetry is mostly found in sponges ?	Sponges are asymmetrical
3.	Presence of water transport system is characteristic of which phylum ?	Porifera
4.	What is the name of pores through which water enters into the body of sponges ?	Ostia
5.	What is the name of pore through which water comes out from body of sponges ?	Osculum
6.	What is the name of central cavity found in the body of members of phylum porifera ?	Spongocoel
7.	What is the function of water canal system in sponges ?	Food gathering, respiratory exchange and removal of waste
8.	What is the name of cells those line the spongocoel ?	Choanocytes or collar cells
9.	Name the structures which support the body of sponges as a skeleton:	Spicules and spongin fibres
10.	The animals which don't have separate sexes are called as :	Hermaphrodite
11.	When development of an organism occurs through larval stage, than this type of development is called as :	Indirect development
12.	Which type of symmetry is found in coelenterates ?	Radial symmetry
13.	Name the cell that is used for defense purposes in coelenterates.	Cnidoblast
14.	Which cnidarians possess a skeleton made up of calcium carbonate ?	Corals
15.	The alternation of Polyp and Medusa forms in coelenterates is called as :	Metagenesis
16.	Which organism is also known as Portuguese man of war ?	Physalia
17.	Members of which phylum are commonly known as sea walnuts or comb jellies ?	Ctenophora
18.	Which structure helps in locomotion in ctenophores ?	Comb plates
19.	The property of a living organism to emit light is called as :	Bioluminescence
20.	Members of which phylum are known as flatworms ?	Platyhelminthes
21.	Which type of symmetry is found in the members of phylum platyhelminthes ?	Bilateral symmetry
22.	Structures which help in osmoregulation and excretion in flatworms are called.	Flame cells
23.	Members of which phylum are also known as roundworms ?	Aschelminthes
24.	Name the phylum in which organ system level of body organisation appeared first time :	Aschelminthes
25.	Which phylum of animals posses pseudocoelomic type of body cavity ?	Aschelminthes
26.	Which structures help in osmoregulation and excretion in Annelids ?	Nephridia
27.	The body surface of annelids is distinctly marked out into segments. These segments are called as :	Metameres

28.	Name the largest phylum of animal kingdom.	Arthropoda
29.	The exoskeleton of arthropods is made up of _____.	Chitin
30.	The name balancing organ in arthropods.	Statocyst
31.	What is the main function of malpighian tubules ?	Excretion
32.	Name the organism which produces silk ?	<i>Bombyx</i>
33.	Name organism which produces lac.	<i>Laccifer</i>
34.	Name the second largest phylum of animal kingdom :	Mollusca
35.	The soft and spongy layer of skin over the visceral hump of molluscs is known as :	Mantle
36.	In which phylum the mantle cavity is found ?	Mollusca
37.	What is the name of file like rasping organ found in molluscs ?	Radula
38.	Animals of which phylum are reared for the production of pearls ?	Mollusca
39.	In which phylum the spiny bodied organisms are included ?	Echinodermata
40.	In which phylum organisms alter their symmetry from bilateral to radial during the development ?	Echinodermata
41.	Members of which phylum have ventral mouth and dorsal anus ?	Echinodermata
42.	Water vascular system is a characteristic of which phylum ?	Echinodermata
43.	Name the excretory organ of <i>balanoglossus</i> :	Proboscis gland
44.	Which subphyla are classified under protochordates ?	Urochordata and cephalochordata
45.	In which subphylum notochord is present only in larval tail ?	Urochordata
46.	In which subphylum notochord extends from head to tail and persistent throughout the life ?	Cephalochordata
47.	In which subphylum notochord is replaced by vertebral column ?	Vertebrata
48.	Animals of which class possess a sucking and circular mouth without jaws ?	Cyclostomata
49.	In which class of fishes mouth is located ventrally ?	Chondrichthyes
50.	Which types of scales are found on the body of cartilagenous fishes?	Placoid scales
51.	In which class of fishes notochord is persistent throughout the life ?	Chondrichthyes
52.	The teeth in cartilaginous fishes are formed due to modification of which type of scales ?	Placoid scales
53.	What is the name of structure that prevents the bony fishes from sinking ?	Air bladder
54.	Why cartilaginous fishes have to swim constantly ?	Because they lack air bladder
55.	Name a fish which has electric organ.	<i>Torpedo</i>
56.	Name a fish which possess poisonous sting.	<i>Trygon</i>
57.	The animals which don't have the capacity to regulate their body temperature are called as _____.	Poikilotherms
58.	The animals which have the capacity to regulate their body temperature are called as _____.	Homiothermous

59.	How many pairs of gills are present in bony fishes ?	4-pairs
60.	Name the cap which covers the gills in fishes :	Operculum
61.	Which structure represents ear in amphibians and reptiles ?	Tympanum
62.	In which class of vertebrates 3-chambered heart is found ?	Amphibia and reptilia
63.	The common chamber for alimentary canal, urinary, bladder and reproductive tracts is called as :	Cloaca
64.	Which class of vertebrates possesses dry and cornified skin with epidermal scales or scutes ?	Reptilia
65.	In which reptiles 4-chambered heart is present ?	Crocodiles
66.	Snakes and lizards shed off their scales often. This phenomenon is called as :	Skin cast
67.	The presence of feathers is characteristic of which class ?	Aves
68.	The bones of birds are long and hollow with air cavities. These types of bones are called as :	Pneumatic bones
69.	Name of the additional chambers found in the digestive tract of birds :	Crop and Gizzard
70.	Name the respiratory organs in birds and mammals :	Lungs
71.	Presence of mammary gland is the unique character of which class ?	Mammalia
72.	Name an oviparous organism with presence of mammary glands:	<i>Ornithorhynchus</i> (Platypus)
73.	Name the phyla which have radial symmetry :	Coelenterata, ctenophora, echinodermata
74.	The undifferentiated layer present between ectoderm and mesoderm in diploblastic animals is known as :	Mesoglea
75.	A cavity in which mesoderm is found in scattered form is called as :	Pseudocoelom
76.	Match the columns :	
	(A) <i>Sycon</i>	(i) Bath sponge
	(B) <i>Spongilla</i>	(ii) Scypha
	(C) <i>Euspongia</i>	(iii) Fresh water sponge
77.	Match the columns :	
	(A) <i>Adamsia</i>	(i) Sea fan
	(B) <i>Pennatula</i>	(ii) Brain coral
	(C) <i>Gorgonia</i>	(iii) Sea pen
	(D) <i>Meandrina</i>	(iv) Sea anemone
78.	Match the columns :	
	(A) <i>Taenia</i>	(i) Filaria worm
	(B) <i>Fasciola</i>	(ii) Round worm
	(C) <i>Ascaris</i>	(iii) Tapeworm
	(D) <i>Wuchereria</i>	(iv) Hook worm
	(E) <i>Ancylostoma</i>	(v) Liver fluke

79.	Match the columns :	
	(A) <i>Pheretima</i>	(i) King crab
	(B) <i>Hirudinaria</i>	(ii) Honey bee
	(C) <i>Apis</i>	(iii) Earthworm
	(D) <i>Limulus</i>	(iv) Blood sucking leech
80.	Match the columns :	
	(A) <i>Pila</i>	(i) Devil fish
	(B) <i>Pinctada</i>	(ii) Chiton
	(C) <i>Sepia</i>	(iii) Apple snail
	(D) <i>Loligo</i>	(iv) Tusk shell
	(E) <i>Octopus</i>	(v) Pearl oyster
	(F) <i>Aplysia</i>	(vi) Cuttlefish
	(G) <i>Dentalium</i>	(vii) Squid
	(H) <i>Chaetopleura</i>	(viii) Sea hare
81.	Match the columns :	
	(A) <i>Asterias</i>	(i) Brittle star
	(B) <i>Echinus</i>	(ii) Sea lily
	(C) <i>Antedon</i>	(iii) Star fish
	(D) <i>Cucumaria</i>	(iv) Sea urchin
	(E) <i>Ophiura</i>	(v) Sea cucumber
82.	Match the columns :	
	(A) <i>Branchiostoma</i>	(i) Saw fish
	(B) <i>Petromyzon</i>	(ii) Dog fish
	(C) <i>Myxine</i>	(iii) Lancelet
	(D) <i>Scoliodon</i>	(iv) Sting ray
	(E) <i>Pristis</i>	(v) Lamprey
	(F) <i>Carcharodon</i>	(vi) Hag fish
	(G) <i>Trygon</i>	(vii) Great white shark
83.	Match the columns :	
	(A) <i>Exocoetus</i>	(i) Angel fish
	(B) <i>Hippocampus</i>	(ii) Rohu
	(C) <i>Labeo</i>	(iii) Fighting fish
	(D) <i>Clarias</i>	(iv) Magur
	(E) <i>Betta</i>	(v) Flying fish
	(F) <i>Pterophyllum</i>	(vi) Sea horse

84.	Match the columns :- (A) <i>Bufo</i> (B) <i>Rana</i> (C) <i>Hyla</i> (D) <i>Ichthyophis</i>	(i) Limbless amphibian (ii) Frog (iii) Toad (iv) Tree frog	(A)-(iii) (B)-(ii) (C)-(iv) (D)-(i)
85.	Match the columns :- (A) <i>Chelone</i> (B) <i>Testudo</i> (C) <i>Chameleon</i> (D) <i>Calotes</i> (E) <i>Naja</i> (F) <i>Bangarus</i> (G) <i>Hemidactylus</i>	(i) Krait (ii) Wall lizard (iii) Garden lizard (iv) Turtle (v) Tortoise (vi) Tree lizard (vii) Cobra	(A)-(iv) (B)-(v) (C)-(vi) (D)-(iii) (E)-(vii) (F)-(i) (G)-(ii)
86.	Match the columns :- (A) <i>Corvus</i> (B) <i>Columba</i> (C) <i>Psittacula</i> (D) <i>Struthio</i> (E) <i>Pavo</i> (F) <i>Aptenodytes</i> (G) <i>Neophron</i>	(i) Vulture (ii) Crow (iii) Penguin (iv) Peacock (v) Ostrich (vi) Pigeon (vii) Parrot	(A)-(ii) (B)-(vi) (C)-(vii) (D)-(v) (E)-(iv) (F)-(iii) (G)-(i)
87.	Match the columns :- (A) <i>Ornithorhynchus</i> (B) <i>Macropus</i> (C) <i>Pteropus</i> (D) <i>Balaenoptera</i> (E) <i>Canis</i> (F) <i>Macaca</i> (G) <i>Felis</i> (H) <i>Equus</i>	(i) Flying fox (ii) Blue whale (iii) Monkey (iv) Dog (v) Platypus (vi) Cat (vii) Kangaroo (viii) Horse	(A)-(v) (B)-(vii) (C)-(i) (D)-(ii) (E)-(iv) (F)-(iii) (G)-(vi) (H)-(viii)
88.	Match the columns :- (A) Operculum (B) Parapodia (C) Scales (D) Comb plates (E) Radula (F) Hairs (G) Choanocytes (H) Gill slits	(i) Ctenophora (ii) Mollusca (iii) Porifera (iv) Reptilia (v) Annelida (vi) Cyclostomata (vii) Mammalia (viii) Osteichthyes	(A)-(viii) (B)-(v) (C)-(iv) (D)-(i) (E)-(ii) (F)-(vii) (G)-(iii) (H)-(vi)

89.	Match the columns :	<table border="0"> <tbody> <tr> <td>(A) Water canal system</td><td>(i) Coelenterata</td><td>(A)-(vii)</td></tr> <tr> <td>(B) Metagenesis</td><td>(ii) Platyhelminthes</td><td>(B)-(i)</td></tr> <tr> <td>(C) Comb plates</td><td>(iii) Mollusca</td><td>(C)-(viii)</td></tr> <tr> <td>(D) Flame cells</td><td>(iv) Arthropoda</td><td>(D)-(ii)</td></tr> <tr> <td>(E) Excretory tube</td><td>(v) Echinodermata</td><td>(E)-(vi)</td></tr> <tr> <td>(F) Jointed appendages</td><td>(vi) Aschelminthes</td><td>(F)-(iv)</td></tr> <tr> <td>(G) Soft bodied animals</td><td>(vii) Porifera</td><td>(G)-(iii)</td></tr> <tr> <td>(H) Water vascular system</td><td>(viii) Ctenophora</td><td>(H)-(v)</td></tr> </tbody> </table>	(A) Water canal system	(i) Coelenterata	(A)-(vii)	(B) Metagenesis	(ii) Platyhelminthes	(B)-(i)	(C) Comb plates	(iii) Mollusca	(C)-(viii)	(D) Flame cells	(iv) Arthropoda	(D)-(ii)	(E) Excretory tube	(v) Echinodermata	(E)-(vi)	(F) Jointed appendages	(vi) Aschelminthes	(F)-(iv)	(G) Soft bodied animals	(vii) Porifera	(G)-(iii)	(H) Water vascular system	(viii) Ctenophora	(H)-(v)																								
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90.	Match the columns :	<table border="0"> <tbody> <tr> <td>(A) Urochordata</td><td>(i) <i>Camelus</i></td><td>(A)-(ii), (viii), (ix)</td></tr> <tr> <td>(B) Hemichordata</td><td>(ii) <i>Ascidia</i></td><td>(B)-(v), (xi)</td></tr> <tr> <td>(C) Arthropoda</td><td>(iii) <i>Crocodilus</i></td><td>(C)-(vii), (xiii), (xv)</td></tr> <tr> <td>(D) Reptilia</td><td>(iv) <i>Elephas</i></td><td>(D)-(iii), (xiv), (xvi)</td></tr> <tr> <td>(E) Mammalia</td><td>(v) <i>Balanoglossus</i></td><td>(E)-(i), (iv), (vi), (x), (xii)</td></tr> <tr> <td></td><td>(vi) <i>Rattus</i></td><td></td></tr> <tr> <td></td><td>(vii) <i>Culex</i></td><td></td></tr> <tr> <td></td><td>(viii) <i>Salpa</i></td><td></td></tr> <tr> <td></td><td>(ix) <i>Doliolum</i></td><td></td></tr> <tr> <td></td><td>(x) <i>Delphinus</i></td><td></td></tr> <tr> <td></td><td>(xi) <i>Saccoglossus</i></td><td></td></tr> <tr> <td></td><td>(xii) <i>Panthera</i></td><td></td></tr> <tr> <td></td><td>(xiii) <i>Aedes</i></td><td></td></tr> <tr> <td></td><td>(xiv) <i>Vipera</i></td><td></td></tr> <tr> <td></td><td>(xv) <i>Anopheles</i></td><td></td></tr> <tr> <td></td><td>(xvi) <i>Alligator</i></td><td></td></tr> </tbody> </table>	(A) Urochordata	(i) <i>Camelus</i>	(A)-(ii), (viii), (ix)	(B) Hemichordata	(ii) <i>Ascidia</i>	(B)-(v), (xi)	(C) Arthropoda	(iii) <i>Crocodilus</i>	(C)-(vii), (xiii), (xv)	(D) Reptilia	(iv) <i>Elephas</i>	(D)-(iii), (xiv), (xvi)	(E) Mammalia	(v) <i>Balanoglossus</i>	(E)-(i), (iv), (vi), (x), (xii)		(vi) <i>Rattus</i>			(vii) <i>Culex</i>			(viii) <i>Salpa</i>			(ix) <i>Doliolum</i>			(x) <i>Delphinus</i>			(xi) <i>Saccoglossus</i>			(xii) <i>Panthera</i>			(xiii) <i>Aedes</i>			(xiv) <i>Vipera</i>			(xv) <i>Anopheles</i>			(xvi) <i>Alligator</i>	
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92.

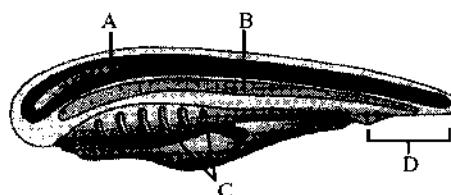
Fill in the blanks :

Character	Non Chordates	Chordates
Notochord	Absent	(a)
Central nervous system	Ventral	(b)
	(c)	Hollow
	Double	(d)
Gills slits	Absent	(e)
Heart	(f)	Ventral
Post anal tail	(g)	Present

- (a) - Present
- (b) - Dorsal
- (c) - Solid
- (d) - Single
- (e) - Present
- (f) - Dorsal
- (g) - Absent

93.

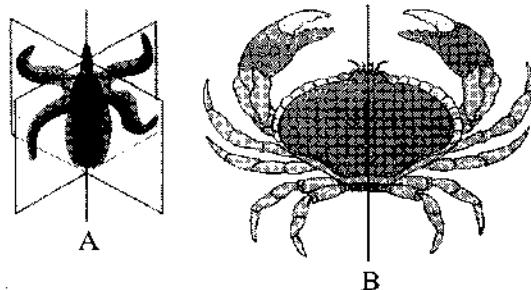
Identify the following A, B, C and D in given figure :



- (A) - Nerve cord
- (B) - Notochord
- (C) - Gill slits
- (D) - Post anal tail

94.

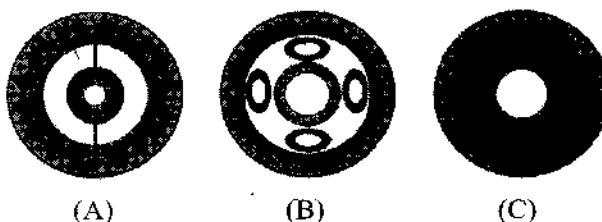
Identify the following symmetries shown in the figures A and B :



- (A)-Radial Symmetry
- (B)- Bilateral symmetry

95.

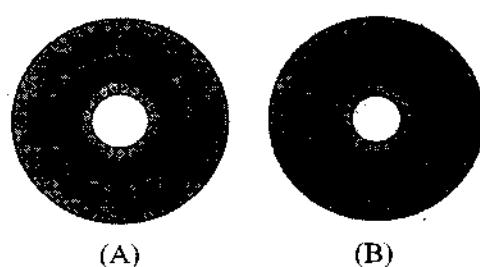
Identify the following coelom shown in the diagrams A, B and C :



- (A) Eucoelom
- (B) Pseudocoelom
- (C) Acoelom

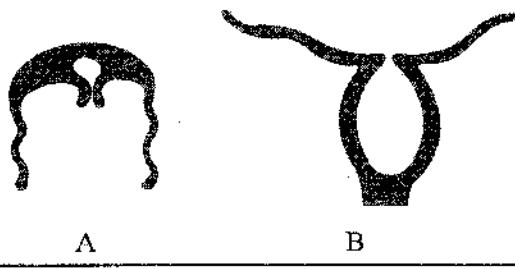
96.

Identify the following body organizations on the basis of germinal layers :



- (A)-Diploblastic,
- (B)-Triploblastic

97. Identify the following body forms shown in the figure :



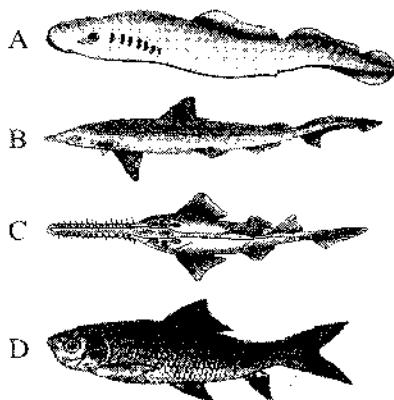
(A)- Medusa, (B)- Polyp

98. The given structure is found in phylum (a) and helps in (b).



(a)- Coelenterata,
 (b)- Anchorage,
 defense and capturing prey.

99. Give the answer of following questions by observations from given figures :



(i) Which fish has air bladder ? (i) - D

(ii) Which fish is known as saw fish ? (ii) - C

(iii) Which fish is cartilaginous fish ? (iii) - B, C

(iv) Which animal is ectoparasite on true fishes ? (iv) - A

(v) Which fish has paired fins ? (v) - B, C, D

(vi) Which fish has bony skeleton ? (vi) - D

(vii) Which fish has 4 - pairs of gills ? (vii) - D

(viii) Which fish has operculum ? (viii) - D

(ix) Which fishes are viviparous ? (ix) - B, C

(x) Which fish lives in fresh water ? (x) - D

100. Select the correct options for given animals:

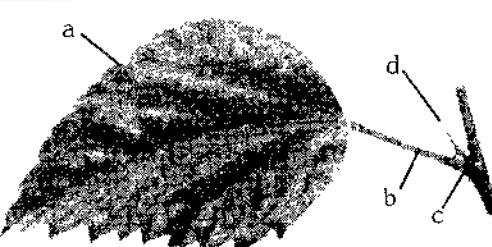


- (i) Diploblastic / Triploblastic
- (ii) Acoelomate / Pseudocoelomate / Eucoelomate
- (iii) Chordate / Non Chordate
- (iv) Vertebrate / Invertebrate
- (v) Urochordate / Cephalochordate

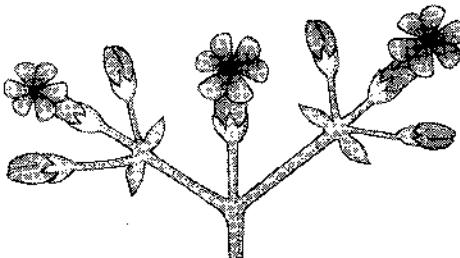
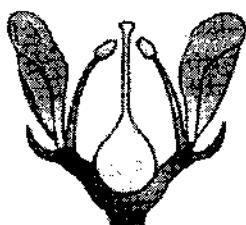
- (i) - Triploblastic
- (ii) - Eucoelomate
- (iii) - Chordate
- (iv) - Invertebrate
- (v) - Urochordate

MORPHOLOGY OF FLOWERING PLANTS

Q.NO.	QUESTIONS	ANSWERS																												
1.	Direct elongation of the radicle leads to the formation of..... root.	primary.																												
2.	Lateral roots includes(a).... and(b).... roots	(a) secondary (b) tertiary																												
3.	The primary root and its branches constitute the	Tap root system																												
4.	When the primary root is short lived and replaced by large number of thin roots, it constitutes the	Fibrous root system																												
5.	Fibrous roots originate from	Base of the stem																												
6.	The roots which arise from the parts of the plant other than the radicle are	Adventitious roots																												
7.	The root is covered at the apex by thimble like structure called	Root cap																												
8.	The region of meristematic activity is situated few millimeters above root cap. True or false?	True																												
9.	Match the following																													
	<table border="1" data-bbox="293 1100 770 1279"> <tbody> <tr> <td>1</td><td>Tap root</td> <td>a</td><td>Monstera</td> </tr> <tr> <td>2</td><td>Fibrous root</td> <td>b</td><td>Wheat</td> </tr> <tr> <td>3</td><td>Adventitious root</td> <td>c</td><td>Mustard</td> </tr> </tbody> </table>	1	Tap root	a	Monstera	2	Fibrous root	b	Wheat	3	Adventitious root	c	Mustard	<table border="1" data-bbox="1087 1100 1198 1279"> <tbody> <tr> <td>1 - c</td> </tr> <tr> <td>2 - b</td> </tr> <tr> <td>3 - a</td> </tr> </tbody> </table>	1 - c	2 - b	3 - a													
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3	Adventitious root	c	Mustard																											
1 - c																														
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3 - a																														
10.	Which region of the root have very small cells, thin walled and with dense protoplasm?	Meristematic zone																												
11.	Which part of root is responsible for the growth of the root in length?	Region of elongation																												
12.	Region of elongation is present ---(a)--- to the region of meristem. And region of maturation is present -(b)– to the region of elongation.	a - Proximal b - Proximal																												
13.	Match the following root modifications																													
	<table border="1" data-bbox="293 1627 817 1964"> <tbody> <tr> <td>1</td><td>For storage</td> <td>a</td><td>Maize</td> </tr> <tr> <td>2</td><td>Prop root</td> <td>b</td><td>Sugarcane</td> </tr> <tr> <td>3</td><td>Stilt root</td> <td>c</td><td>Sweet potato</td> </tr> <tr> <td>4</td><td>For respiration</td> <td>d</td><td>Turnip</td> </tr> <tr> <td></td><td></td> <td>e</td><td>Banyan</td> </tr> <tr> <td></td><td></td> <td>f</td><td>Rhizophora</td> </tr> </tbody> </table>	1	For storage	a	Maize	2	Prop root	b	Sugarcane	3	Stilt root	c	Sweet potato	4	For respiration	d	Turnip			e	Banyan			f	Rhizophora	<table border="1" data-bbox="1087 1627 1214 1852"> <tbody> <tr> <td>1 - c, d</td> </tr> <tr> <td>2 - e</td> </tr> <tr> <td>3 - a, b</td> </tr> <tr> <td>4 - f</td> </tr> </tbody> </table>	1 - c, d	2 - e	3 - a, b	4 - f
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14.	Stilt roots arise from	Lower node of the stem																												
15.	Hanging structures which provide support to banyan trees are	Prop roots																												

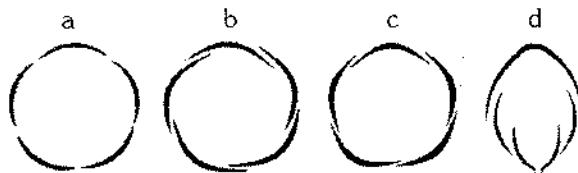
16.	In <i>Rhizophora</i> , pneumatophores help in	Respiration																												
17.	Shoot develops from the ---(a)--- of the embryo	a - plumule																												
18.	Part of the plant which bears nodes and internodes is known as	Stem																												
19.	Stem is generally ---(a)--- when young and later often becomes woody and dark ----(b)	a - Green b - Brown																												
20.	Match the following																													
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1 - e																														
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3 - b, d																														
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21.	Stem modified into flattened structure in ---(a)--- or fleshy cylindrical structure in ----(b)---- and perform photosynthesis.	a - <i>Opuntia</i> b - <i>Euphorbia</i>																												
22.	In which plants each node bears a rosette of leaves and a tuft of roots?	<i>Pistia</i> and <i>Eichhornia</i>																												
23.	Which type of sub-aerial modification occur in Jasmine.	Stolon																												
24.	In banana, the growing lateral branch come out giving rise to leafy shoots.	Obliquely upward																												
25.	 Recognise a, b, c and d.	a - Lamina b - Petiole c - Leaf base d - Stipule																												
26.	Leaves originate from meristem.	Shoot apical																												
27.	Leaf develops at the ---(a)--- and bears a ----(b)---- in its axil.	a - Node, b - Bud																												
28.	The axillary bud later develops into a	Branch or flower																												
29.	The leaves are arranged in..... manner on stem.	Acropetal																												
30.	Leaf may bear two lateral small leaf like structures which are known as	Stipules																												
31.	Sheathing leaf base is found in monocots, true or false.	True																												
32.	In some ---(a)--- plants the leaf base may become swollen which is known as ---(b)---	a - leguminous b - pulvinus																												
33.	Vein provide ---(a)--- to the leaf blade and act as channels of ---(b)---	a - Rigidity b - Transport																												

34.	The arrangement of veins and veinlets in the lamina of leaf is termed as	Venation															
35.	When the veinlets form a network, the venation is known as	Reticulate venation															
36.	When the veins run parallel to each other within a lamina the venation is termed as	Parallel venation															
37.	In a leaf, when its lamina is entire or when incised, the incisions do not touch the midrib then this type of leaf is known as	Simple leaf															
38.	When the incisions of leaf lamina reach upto the midrib the leaf is known as	Compound leaf															
39.	A is present in the axil of petiole in both simple and compound leaves but not in the axil of leaflets.	Bud															
40.	Rachis is found in..... leaf.	Pinnately compound															
41.	In neem plant, which type of leaf is present	Pinnately compound leaf															
42.	In palmately compound leaf, the leaflets are attached at the ---(a)--- as in ----- (b)----- .	a - Common point i.e. tip of Petiole b - Silk cotton															
43.	Match the following	<table border="1" data-bbox="282 1057 897 1230"> <tbody> <tr> <td>1</td> <td>Alternate leaves</td> <td>a</td> <td><i>Alstonia</i></td> </tr> <tr> <td>2</td> <td>Opposite leaves</td> <td>b</td> <td>Mustard, Chinarose</td> </tr> <tr> <td>3</td> <td>Whorled</td> <td>c</td> <td>Guava, <i>Calotropis</i></td> </tr> </tbody> </table> <table border="1" data-bbox="1081 1057 1176 1230"> <tbody> <tr> <td>1 - b</td> </tr> <tr> <td>2 - c</td> </tr> <tr> <td>3 - a</td> </tr> </tbody> </table>	1	Alternate leaves	a	<i>Alstonia</i>	2	Opposite leaves	b	Mustard, Chinarose	3	Whorled	c	Guava, <i>Calotropis</i>	1 - b	2 - c	3 - a
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44.	Match the following	<table border="1" data-bbox="282 1288 827 1454"> <tbody> <tr> <td>1</td> <td>Leaf tendril</td> <td>a</td> <td>Venus fly trap</td> </tr> <tr> <td>2</td> <td>Leaf spine</td> <td>b</td> <td>Pea</td> </tr> <tr> <td>3</td> <td>Insectivorous plant</td> <td>c</td> <td>Cactus</td> </tr> </tbody> </table> <table border="1" data-bbox="1081 1288 1176 1454"> <tbody> <tr> <td>1 - b</td> </tr> <tr> <td>2 - c</td> </tr> <tr> <td>3 - a</td> </tr> </tbody> </table>	1	Leaf tendril	a	Venus fly trap	2	Leaf spine	b	Pea	3	Insectivorous plant	c	Cactus	1 - b	2 - c	3 - a
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2 - c																	
3 - a																	
45.	Name the plant in which, the leaves are short lived and petiole modify in leafy structure	<i>Australian acacia</i>															
46.	Flower is a modified	Shoot															
47.	The arrangement of flower on floral axis is known as	Inflorescence															
48.	In ---(a)--- inflorescence the main axis continuous to grow. Whereas in ---(b)--- inflorescence main axis terminates in a flower.	a - Racemose b - Cymose															
49.	In racemose type of inflorescence the flowers are arranged in	Acropetal manner															
50.	In a typical flower, calyx, corolla, androecium and gynoecium are attached on	Thalamus															
51.	Calyx and corolla are ---(a)---- organs while androecium, and gynoecium are ----- (b)----- organs.	a - Accessory b - Reproductive or essential															
52.	When calyx and corolla are not distinct then they are known as	Perianth															
53.	If a flower has both androecium and gynoecium, it is a..... flower.	Bisexual															

54.	If a flower having either only stamens or only carpels it is a..... flower.	Unisexual																							
55.	Match the following																								
	<table border="1" data-bbox="333 505 992 774"> <tbody> <tr> <td>1</td><td>Actinomorphic flower</td> <td>a</td><td><i>Mustard, Datura</i></td> </tr> <tr> <td>2</td><td>Zygomorphic flower</td> <td>b</td><td><i>Canna</i></td> </tr> <tr> <td>3</td><td>Asymmetric flower</td> <td>c</td><td><i>Chilli</i></td> </tr> <tr> <td></td><td></td> <td>d</td><td><i>Cassia</i></td> </tr> <tr> <td></td><td></td> <td>e</td><td><i>Pea, Bean</i></td> </tr> </tbody> </table>	1	Actinomorphic flower	a	<i>Mustard, Datura</i>	2	Zygomorphic flower	b	<i>Canna</i>	3	Asymmetric flower	c	<i>Chilli</i>			d	<i>Cassia</i>			e	<i>Pea, Bean</i>	<table border="1" data-bbox="1135 505 1262 662"> <tbody> <tr> <td>1 - a, c</td> </tr> <tr> <td>2 - d, e</td> </tr> <tr> <td>3 - b</td> </tr> </tbody> </table>	1 - a, c	2 - d, e	3 - b
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2	Zygomorphic flower	b	<i>Canna</i>																						
3	Asymmetric flower	c	<i>Chilli</i>																						
		d	<i>Cassia</i>																						
		e	<i>Pea, Bean</i>																						
1 - a, c																									
2 - d, e																									
3 - b																									
56.	 Recognize the type of inflorescence	Cymose inflorescence																							
57.	 Recognize the type of flower.	Perigynous flower																							
58.	Match the following	<table border="1" data-bbox="349 1515 1008 1784"> <tbody> <tr> <td>1</td><td>Hypogynous flower</td> <td>a</td><td>Cucumber</td> </tr> <tr> <td>2</td><td>Perigynous flower</td> <td>b</td><td>Mustard</td> </tr> <tr> <td>3</td><td>Epigynous flower</td> <td>c</td><td>Chinarose</td> </tr> <tr> <td></td><td></td> <td>d</td><td>Plum</td> </tr> <tr> <td></td><td></td> <td>e</td><td>Guava</td> </tr> </tbody> </table>	1	Hypogynous flower	a	Cucumber	2	Perigynous flower	b	Mustard	3	Epigynous flower	c	Chinarose			d	Plum			e	Guava			
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		d	Plum																						
		e	Guava																						
59.	In case of perigynous flower, the ovary is	Half inferior																							
60.	When the sepals are united then condition is known as	Gamosepalous																							
61.	When the petals are free then condition is known as	Polypetalous																							
62.	The mode of arrangement of sepals or petals in floral bud with respect to other members of the same whorl is	Aestivation																							
63.	If the margins of sepals or petals overlap one another but not in any particular direction, then this type of aestivation is known as	Imbricate aestivation																							



64.



Recognise the type of aestivation in a, b, c and d

a - Valvate

b - Twisted

c - Imbricate

d - Vexillary

65.

Match the following

1	Valvate	a	<i>Cassia</i>
2	Twisted	b	Pea
3	Imbricate	c	<i>Calotropis</i>
4	Vexillary	d	China rose
		e	Lady finger
		f	Gulmohur

1 - c

2 - d, e

3 - a, f

4 - b

66.

Each anther is usually ---(a)--- and each lobe has ---(b)--- chambers

a - Bilobed, b - Two

67.

The pollen grains are produced in (Pollensac / Ovule)

Pollen sac

68.

A sterile stamen is known as

Staminode

69.

When the stamens are attached to the petals, they are known as

Epipetalous

70.

Match the following

1	Epiphyllous	a	Citrus
2	Monadelphous	b	Pea
3	Diadelphous	c	China rose
4	Polyadelphous	d	Lily

1 - d

2 - c

3 - b

4 - a

71.

There may be variation in the length of filaments within a flower as in

Salvia and mustard

72.

In rose and lotus, the condition of carpels is

Apocarpous

73.

Syncarpous condition is found in

Mustard and tomato

74.

After fertilisation, the ovules develop into ---(a)--- and the ovary matures into a ----(b)---- .

a - Seeds

b - Fruit

75.

The arrangement of ovules within the ovary is known as

Placentation

76.

Ripened or mature ovary is known as

Fruit

77.

If a fruit is formed without fertilisation of ovary it is called

Parthenocarpic fruit

78.

Which of the following is not correct ?

1 - Primrose has free central

1. Axile - Primrose

2. Parietal - Mustard, *Argemone*

3. Free central-*Dianthus*

4. Basal - Sunflower, Marigold

79.

Ovary is one chambered but it becomes two chambered due to formation of the false septum in ... (a).... and(b)....

(a) Mustard (b) *Argemone*

80.

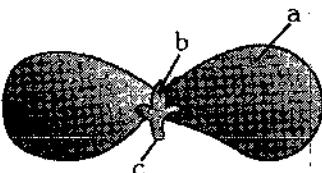
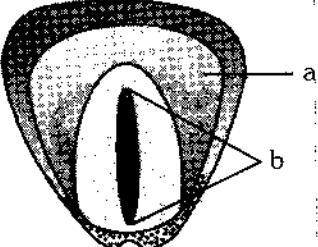
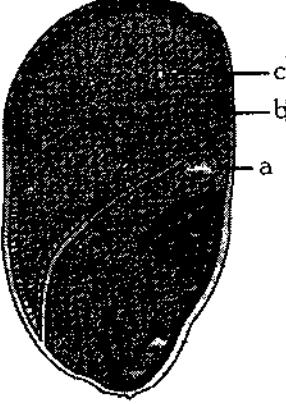
Generally, the fruit is consist of ---(a)--- and ---(b)---

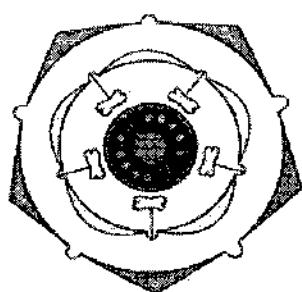
a - Pericarp, b - Seeds

81.

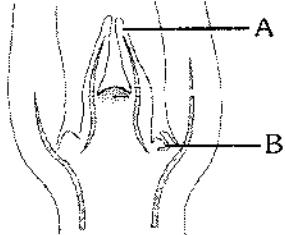
In mango and coconut the fruit is known as

Drupe

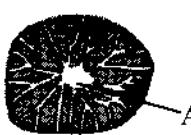
82.	The drupe fruits are developed from and superior ovary.	Monocarpellary
83.	The edible part of mango is	Mesocarp
84.	The mesocarp of coconut is	Fibrous
85.	A seed is generally made up of	Seed coat and an embryo
86.	The seed coat has two layers, the outer ----(a)---- and the inner ----(b)----	a - Testa b - Tegmen
87.	 Recognise the a, b and c in the diagram.	a - Cotyledon b - Plumule c - Radicle
88.	Orchid seed is (non endospermic or endospermic)	Non-endospermic
89.	In the seeds of cereal the seed coat and fruit wall are (Fused/Free)	Fused
90.	In maize, the outer covering of endosperm separates the embryo by a proteinous layer called	Aleurone layer
91.	In monocots, one large and shield shaped cotyledon is known as	Scutellum
92.	The plumule and radicle are enclosed in sheaths which are ----- (a) ----- and ----- (b) ----- respectively	a - Coleoptile b - Coleorrhiza
93.	 Recognise a and b	a - Endosperm b - Embryo
94.	 Recognise a, b and c in the diagram	a - Scutellum b - Aleurone layer c - Endosperm
95.	Floral formula of mustard is	$\oplus \textcircled{2} \text{ } K_{2+2} \text{ } C_4 \text{ } A_{2+4} \text{ } G_{(2)}$
96.	Papilionatae is a subfamily of	Leguminosae
97.	Which structure of petals encloses the stamen and pistil.	Keel

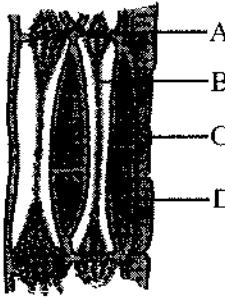
98.	Floral formula of Pea is	$\% \text{♀} \text{♂} \text{K}_{(5)} \text{C}_{1+2+(2)} \text{A}_{(9+1)} \text{G}_1$																		
99.	In fabaceae family, the gynoecium is monocarpellary, unilocular with many ovules, single style and superior ovary. (True/False)	True																		
100.	How many of the plants given below are comes under fabaceae family - Moong, Soyabean, <i>Indigofera</i> , Sunhemp, Sesbania, <i>Lupinus</i> , Mulaithi	All																		
101.	Solanaceae family commonly known as	Potato family																		
102.	In the members solanaceae family the seed is (Endospermic or non-endospermic)	Endospermic																		
103.	The floral formula of <i>Petunia</i> is	$\oplus \text{♀} \text{♂} \text{K}_{(5)} \text{C}_{(5)} \text{A}_5 \text{G}_{(2)}$																		
104.	Persistent calyx is found in the members of (Solanaceae/Liliaceae)	Solanaceae																		
105.	How many of the plants given below are comes under solanaceae family :- Tobacco, Tomato, Chilli, Belladonna, Ashwagandha, <i>Petunia</i> , Makoi	All																		
106.	Family Liliaceae is commonly called	Lily family																		
107.	Epitopalous condition is found in (Fabaceae/Liliaceae)	Liliaceae																		
108.	In the members of family liliaceae the gynoecium is tricarpellary, syncarpous, trilocular with many ovules and superior ovary. (True/False)	True																		
109.	Floral formula of onion is	$\text{Br} \text{♀} \text{P}_{(3+3)} \text{A}_{3+3} \text{G}_{(3)}$																		
110.	How many of the plants given below are comes under family :- Liliaceae <i>Aloe</i> , <i>Asparagus</i> , <i>Tulip</i> , <i>Gloriosa</i> , <i>Colchicum</i>	All																		
111.	In vexillary aestivation, posterior petal is known as	Standard or Vexillum																		
112.	Underground modification of stem i.e. bulbs, corms and rhizomes comes under.... family.	Liliaceae																		
113.	Fruit of liliaceae family is	Capsule, rarely berry																		
114.		Solanaceae family																		
115.	Recognise the family which is related to above floral diagram.																			
	Match the following																			
	<table border="1"> <tbody> <tr> <td>1</td> <td>Fabaceae</td> <td>i</td> <td>Swollen placenta</td> </tr> <tr> <td>2</td> <td>Solanaceae</td> <td>ii</td> <td>Diadelphous stamens</td> </tr> <tr> <td>3</td> <td>Liliaceae</td> <td>iii</td> <td>Epitopalous condition</td> </tr> </tbody> </table>	1	Fabaceae	i	Swollen placenta	2	Solanaceae	ii	Diadelphous stamens	3	Liliaceae	iii	Epitopalous condition	<table border="1"> <tbody> <tr> <td>1 - ii</td> <td></td> </tr> <tr> <td>2 - i</td> <td></td> </tr> <tr> <td>3 - iii</td> <td></td> </tr> </tbody> </table>	1 - ii		2 - i		3 - iii	
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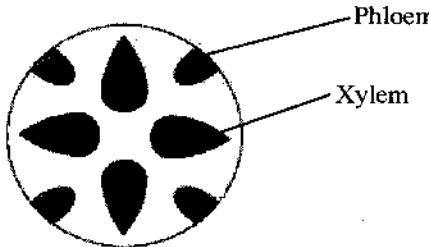
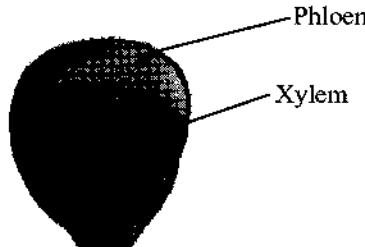
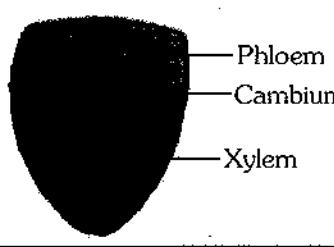
ANATOMY OF FLOWERING PLANTS

Q.NO.	QUESTIONS	ANSWERS
1.	Study of internal structure of plants is called.....	Plant Anatomy
2.	A group of cells having a common....(A)....and usually performing a common function, called....(B)....	(A) Origin (B) Tissue
3.	.....(A).....in plants is largely restricted to specialised regions of active cell division, called....(B).....	(A) Growth (B) Meristem
4.	The term meristem is derived from....(A)...word meristos, which means....(B)...	(A) Greek (B) Divided
5.	The meristem which occurs at the tips of roots and shoots and produce primary tissues are called	Apical meristems
6.	Given figure represents L.S. of shoot apex. In which labelled regions 'A' & 'B' are respectively.	(A) Leaf primordium (B) Axillary bud
		
7.	The meristem that occurs in the mature region of roots and shoots of many plants particularly those that produce woody axis and appear later than primary meristem is called.	Secondary meristem
8.	The structure(s) which is derived from shoot apical meristem and present in axil (s) of leaf (leaves) and are capable of forming a branch or a flower, called.....(s).	Axillary bud
9.	The meristem which occur in grasses between mature tissues and regenerate parts removed by grazing herbivores is known as.....	Intercalary meristem
10.	Both....(A)....and intercalary meristems are....(B)....meristems and contribute to the formation of the primary plant body.	(A) Apical meristem (B) Primary
11.	List of some of meristems is given below : (A) Fascicular vascular cambium (B) Inter fascicular cambium (C) Phellogen or cork cambium On the basis of location in plant body above meristems are placed in which group ?	Lateral meristem
12.	Which simple permanent tissue forms the major component with in plant <i>organs</i> ?	Parenchyma

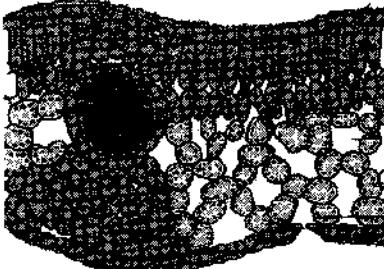
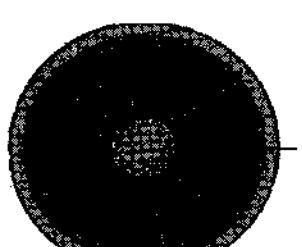


13.	<ul style="list-style-type: none">Cells are generally isodiametric.Cells may be spherical, oval, rounded, polygonal or elongated in shape.Their walls are thin and made up of <i>cellulose</i>.The cells may either be closely packed or have intercellular spaces. <p>Above characters of cells related to which type of simple permanent tissue?</p>	Parenchyma
14.	Which simple tissue performs various functions like photosynthesis secretion and storage ?	Parenchyma
15.	Which tissue occurs in homogenous layers or in patches below the epidermis in stem of decotyledonous plants ?	Collenchyma
16.	.....(A).....consists of cells which are much thickended at the corners due to the deposition of cellulose, hemicellulose and...(B)...	A-Collenchyma B-Pectin
17.	Which simple permanent tissue provides mechanical support to the growing parts of plant such as young stem and petiole of a leaf.	Collenchyma
18.	On the basis of variation in form, structure and development sclerenchyma cells are of how many types ?	Two
19.	Which simple permanent tissue consists of long narrow cells with thick and lignified walls having a few or numerous pits.	Sclerenchyma
20.	In the given figure, labelled structure 'A' is :- 	Lumen
21.	Which type of sclerenchyma cells are found in the fruit wall of nuts, pulp of fruits like guava, pear and sapota, seed coats of legumes and leaves of tea.	<i>Sclereids</i>
22.	Permanent tissues which are made up of more than one type of cells and these cells work together as a unit.	Complex tissues
23.	Tracheids are elongated cells with thick and....(A)....walls and ....(B)...ends.	A-Lignified B-Tapering
24.	The presence of vessels in xylem is characteristics feature of .....(A).....	A-Angiosperms
25.	Which xylem element have highly thickened walls and obliterated central lumen?	Xylem fibre
26.	Which xylem element store food material in the form of starch or fats and other substances like tannin?	Xylem Parenchyma

27.	Given figure, represents L.S. of phloem tissue. In which labelled structures A,B,C & D. respectively.	<p>A-Sieve pore B-Sieve tube element C-Phloem parenchyma D-Companion cell</p> 																				
28.	Plant group in which phloem is composed of sieve tube elements, companion cells, phloem parenchyma & Phloem fibres.	Angiosperms																				
29.	Spermatophytes in which phloem have albuminous cells and sieve cells	Gymnosperms																				
30.	Phloem elements which are long, tube-like structures, arranged longitudinally and are associated with the companion cells.	Sieve tube elements.																				
31.	A mature sieve element possesses a peripheral cytoplasm and a large.....(A).....but lacks aB.....	(A)-Vacuole (B)-Nucleus																				
32.	The functions of(A)....are controlled by the....(B)....of companion cells.	(A)-Sieve tubes (B)-Nucleus.																				
33.	Match the column-I with column-II	A-III, B-IV, C-II, D-I																				
	<table border="1"> <thead> <tr> <th></th> <th>Column-I</th> <th></th> <th>Column-II</th> </tr> </thead> <tbody> <tr> <td>(A)</td> <td>Ray parenchymatous cells</td> <td>(I)</td> <td>Store food material and other substances like resin, latex & mucilage</td> </tr> <tr> <td>(B)</td> <td>Companion cells</td> <td>(II)</td> <td>Devoid of protoplasm at maturity</td> </tr> <tr> <td>(C)</td> <td>Phloem fibres</td> <td>(III)</td> <td>Radial conduction</td> </tr> <tr> <td>(D)</td> <td>Phloem parenchyma</td> <td>(IV)</td> <td>Help in maintaining the pressure gradient in the sieve tubes</td> </tr> </tbody> </table>		Column-I		Column-II	(A)	Ray parenchymatous cells	(I)	Store food material and other substances like resin, latex & mucilage	(B)	Companion cells	(II)	Devoid of protoplasm at maturity	(C)	Phloem fibres	(III)	Radial conduction	(D)	Phloem parenchyma	(IV)	Help in maintaining the pressure gradient in the sieve tubes	
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(D)	Phloem parenchyma	(IV)	Help in maintaining the pressure gradient in the sieve tubes																			
34.	The protophloem has....(A).... sieve tubes whereas metaphloem has.....(B)....sieve tubes.	A-Narrow B-Bigger																				
35.	On the basis of their....(A)....and(B)....there are three types of tissue systems.	A-Structure/morphology B-Location/Position																				
36.	Phloem fibre are made up of(A).... cells. These are generally absent in the(B).....	A-Sclerenchymatous B-Primary Phloem																				
37.	Epidermal cell are(A).... with a small amount of(B)..... and large vacuole.	A-Parenchymatous B-Cytoplasm																				

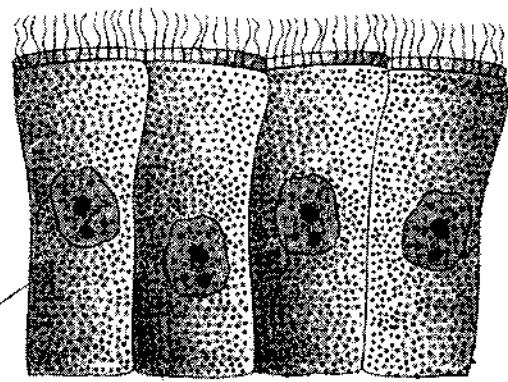
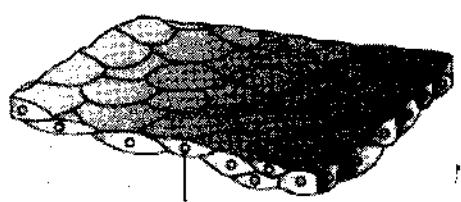
38.	In dicots, guard cells are ....(A).... shaped whereas in grasses guard cells are ....(B).... shaped.	A-bean B-dumb-bell
39.	The stomatal aperture, guard cells and the surrounding subsidiary cells are together called ... (A)....	A-Stomatal apparatus
40.	The root hairs are ....(A).... elongations of the ....(B).... cells and help absorb water and minerals from the soil.	A-Unicellular B-Epidermal
41.	All tissues except ....(A).... and ... (B).... constitute the ground tissue System.	A-Epidermis B-Vascular bundles
42.	In ....(A)...., the ground tissue consists of thin walled chloroplasts containing cells and is called ... (B)....	A-Leaves B-Mesophyll
43.	Given figure represents which type of vascular bundle ?	Radial
	 <p>Phloem</p> <p>Xylem</p>	
44.	Given figure represents which type of vascular bundle ?	Conjoint, collateral & closed
	 <p>Phloem</p> <p>Xylem</p>	
45.	Given figure represents which type of vascular bundle?	Conjoint, collateral & open
	 <p>Phloem</p> <p>Cambium</p> <p>Xylem</p>	
46.	Which type of vascular bundles are found in roots ?	Radial
47.	List of some of the structural part is given below :- Pericycle, Pith vascular bundles and medullary rays Which is not a part of stele in the primary internal structure of dicotyledonae and monocotyledonae roots.	Medullary rays
48.	The cross section of a plant material shows the following anatomical features under microscope:- (a) usually more than six xylem bundles with exarch xylem (b) pith is large and well developed (c) Radial arrangement of xylem and phloem bundles. The plant material should be :-	Monocotyledonous root

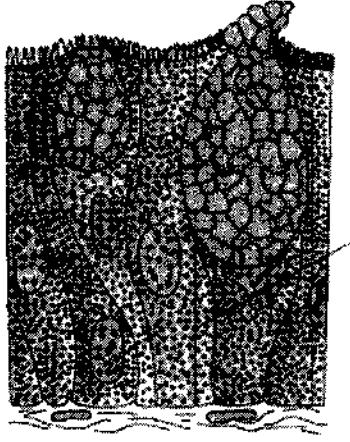
49.	In the internal structure of roots, casparyan strips are present in :-	Endodermis
50.	The cross section of a plant material shows the following anatomical features under microscope. (a) usually two to four xylem and phloem patches with exarch xylem. (b) pith in small or inconspicuous. (c) Radial arrangement of xylem & phloem bundle. The plant material should be.	Dicotyledonae root
51.	...(A)... roots are endogenous in origin and originates from the cells of ...(B)....	A-Lateral B-Pericycle
52.	In dicotyledonae stem, which layer is also termed as starch sheath?	Endodermis
53.	List of some of the plant materials is given below :- • Dicotyledonae root • Monocotyledonae root • Dicotyledonae stem • Monocotyledonae stem Which plant material have sclerenchymatous pericycle in patches. located just above phloem bundles in the primary internal structure.	Dicotyledonae stem
54.	List of some the plant materials is given below :- • Dicotyledonae root • Dicotyledonae stem • Monocotyledonae root Which plant material have bundle cap in the primary internal structure ?	Dicotyledonae stem
55.	In the internal structure of sunflower stem, in between the vascular bundles there are a few layers of radially placed ...(A)... cells, which constitute... (B)...	A-Parenchymatous B-Medullary rays
56.	Which type of vascular bundles are found in the primary internal structure of dicotyledonae stem (eg. Sunflower stem) ?	Conjoint, collateral & open
57.	The cross section of a plant material shows the following anatomical features under microscope:- (a) Sclerenchymatous bundle sheath (b) Many vascular bundles are scattered in parenchymatous ground tissue, each vascular bundle is surrounded by sclerenchymatous bundle sheath (c) Vascular bundles are usually oval shaped. (d) Vascular bundles are conjoint, collateral & closed and xylem is endarch (e) Phloem parenchyma is absent and water containing cavities are present within the vascular bundles The plant material should be :-	Monocotyledonae stem

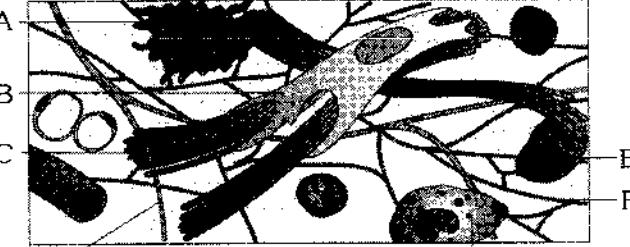
58.	Look at the given figure and find the position (Adaxial or abaxial) of xylem in the vascular bundle.	Adaxial
		
59.	In a dorsiventral leaf, palisade parenchyma lies towards ... (A) ... and spongy parenchyma lies towards ... (B) ... in position.	A- Adaxial B-Abaxial
60.	In grasses, certain ... (A) ... epidermal cells along the veins modify themselves into large, empty, colourless cells. These cells are called ... (B) ... cells.	A-Adaxial B-Bulliform
61.	The ... (A) ... venation in ....(B) ... leaves is reflected in the near similar sizes of vascular bundles (except in main veins) as seen in vertical section of the leaves.	A-Parallel B-Monocot
62.	In a isobilateral leaf, two distinct patches of ... (A) ... are present above and below of each large ... (B) ... which extend towards upper and lower epidermis, respectively.	A-Sclerenchyma B- Vascular bundle
63.	In dicot stem the cells of cambium present between primary xylem and primary phloem is the ....(A)... cambium.	A-Intra fascicular
64.	At some places, the cambium forms a narrow bands of ... (A) ... , which passes through the secondary xylem and the secondary phloem in the radial directions. These are the ... (B)	A-Parenchyma B-Secondary Medullary rays
65.	Name the lateral meristem which is responsible for the formation of phellem and pheloderm.	Phellogen (Cork cambium)
66.	Name the lateral meristem which is responsible for the formation of secondary xylem, secondary phloem and secondary medullary rays.	Vascular cambium
67.	In the given figure Labelled Structure 'x' is :-	x=Primary xylem
		
68.	The ...A... wood is lighter in colour and exhibit low density whereas ...B... wood is darker in colour and exhibit high density.	A-Spring B-Autumn
69.	Heart wood comprises dead elements with highly ...A... walls and it does not conduct water & minerals.	A-Lignified

70.	Which lateral meristem usually develops in cortical region of dicot stem?	Phellogen or cork cambium
71.	....'A'.... is impervious to water due to ...B.. deposition in cell wall	(A) Phellem/cork (B) suberin
72.	Phellem, phellogen and ...A... are collectively termed as ...B...	A-Pheloderm or secondary cortex B-Periderm
73.	....'A'... is a non-technical term that refers to all tissues exterior to ....'B'... therefore including secondary phloem	A-Bark B-Vascular cambium
74.	Consider the following statements : (a) Complimentary cells are thin walled, rounded, colourless parenchymatous and non-suberized (b) Secondary phloem and periderm are included in bark. (c) In a dicot root, vascular cambium is completely secondary in origin (d) In a dicot root, vascular cambium is initially wavy which later becomes circular. How many of above statements are correct ?	Four
75.	Consider the following statements (a) In temperate regions, climatic condition are not uniform throughout the year. (b) Lenticels occur in most woody trees. (c) Complimentary cells are formed by the activity of phellogen. How many of above statements are correct ?	Three

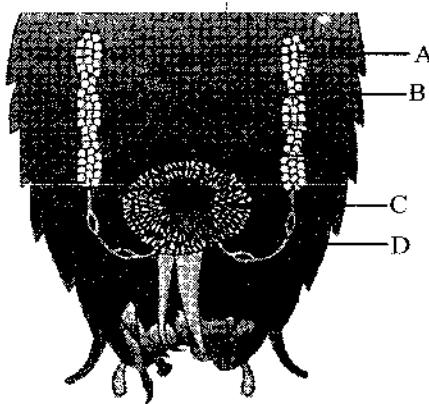
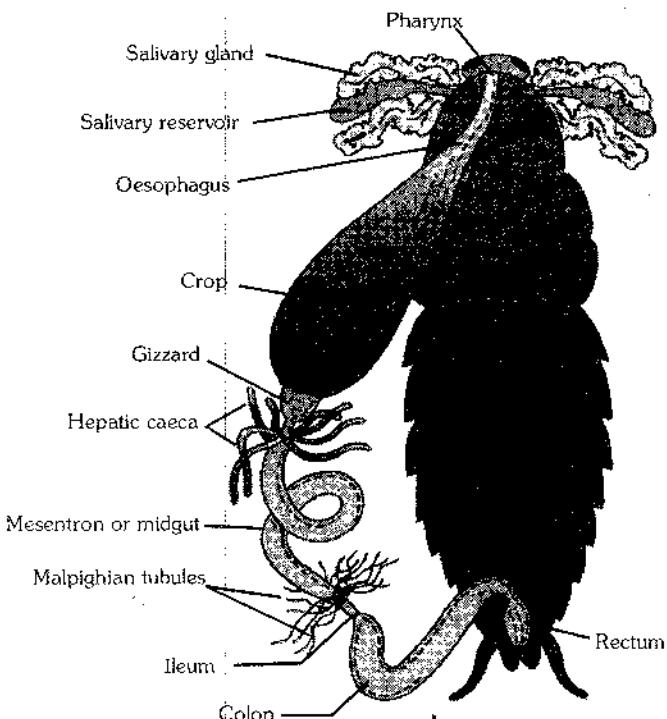
STRUCTURAL ORGANISATION IN ANIMALS (ANIMAL TISSUE)

Q.NO.	QUESTIONS	ANSWERS
1.	Mark the statement as true or false (a) In unicellular organisms all the functions are performed by single cell. (b) In the complex body of multicellular animals different functions are carried out by different group of cells. (c) In multicellular animals, a group of similar cells alongwith intercellular substances perform a specific function. Such an organisation is called tissue. (d) The functions of cells vary according to their structure .	True True True False
2.	This tissue has a free surface, which faces either a body fluid or the outside environment and thus provides a covering or a lining for some part of the body. The cells are compactly packed with little intercellular matrix. This tissue is	Epithelial tissue
3.	..... epithelium is composed of a single layer of cells and functions as a lining for body cavities, ducts and tubes.	Simple
4.	..... epithelium consists of two or more cell layers and has protective function as it does in our skin.	Compound
5.	 This epithelium is found in	Fallopian tubes , Brain ventricles
6.	 This epithelium is found in	Air sacs and blood vessels
7.	The epithelium is made of a single thin layer of flattened cells with irregular boundaries.	simple squamous

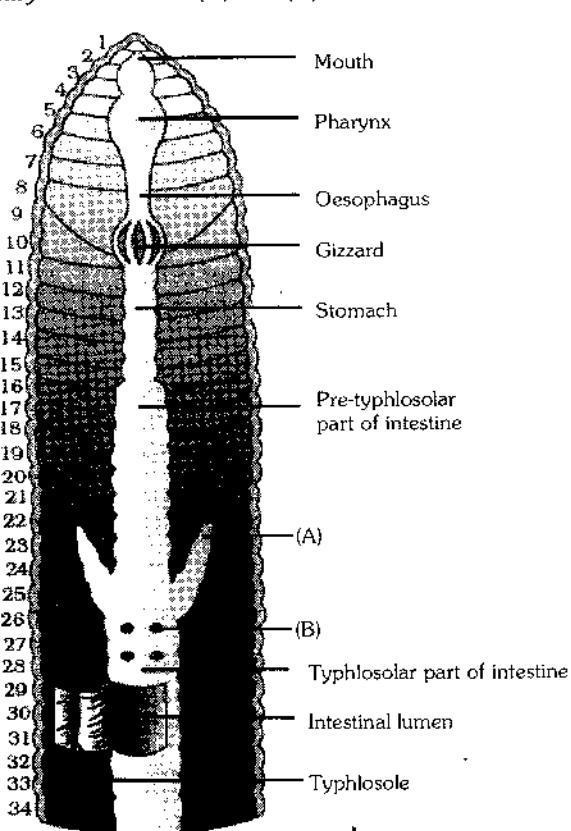
8.	The epithelium is composed of a single layer of cube-like cells. This is commonly found in and tubular parts of nephrons in kidneys and its main functions are and	Cuboidal, Ducts of glands, Secretion, Absorption
9.	The epithelium of nephron in the kidney has microvilli.	Proximal convoluted tubule
10.	Columnar epithelium is found in the walls of and	Stomach , intestine
11.	What is the function of Cilia ?	To move particles and mucus in a specific direction over epithelium
12.	Bronchioles and fallopian tubes are lined by	Ciliated epithelium
13.	Some of the columnar or cuboidal cells get specialised for secretion and are called epithelium.	glandular
14.	 Give an example of this gland	Goblet cells
15.	..... glands secrete mucus, saliva, earwax, oil, milk, digestive enzymes and other cell products.	Exocrine
16.	..... epithelium is made of more than one layer (multi-layered) of cells and thus has a limited role in	Compound, Secretion and absorption
17.	Write the functions of compound epithelium.	To provide protection against chemical and mechanical stress
18.	..... junctions help to stop substances from leaking across a tissue.	Tight
19.	..... junctions perform cementing to keep neighbouring cells together.	Adhering
20.	..... junctions facilitate the cells to communicate with each other by connecting the cytoplasm of adjoining cells, for rapid transfer of ions, small molecules and sometimes big molecules.	Gap

21.	..... tissues are most abundant and widely distributed in the body of complex animals.	Connective
22.	Connective tissues are named as connective tissues. Why?	Because of their special function of linking and supporting other tissues / organs of the body
23.	In all connective tissues except, the cells secrete fibres of structural proteins called collagen or elastin.	blood
24.	 <p>Identify A, B, C, D, E and F in the given diagram</p>	(A) MACROPHAGE (B) FIBROBLASTS (C) COLLAGEN FIBERS (D) ELASTIN FIBRES (E) LYMPHOCYTE (F) RETICULAR FIBRES
25.	Connective tissues are classified into three types : (i) connective tissue, (ii) connective tissue and (iii) connective tissue.	(i) loose (ii) dense (iii) specialised
26.	..... connective tissue has cells and fibres loosely arranged in a semi-fluid ground substance, for example, areolar tissue present beneath the skin	Loose
27.	Loose connective tissue which store fat is	adipose
28.	In the connective tissues, the collage fibres are present in rows between many parallel bundles of fibres which attach skeletal muscles to bones and which attach one bone to another are examples of this tissue.	Dense regular, tendons, ligaments
29.	The intercellular material of cartilage is and and resists compression.	solid, pliable
30.	Most of the cartilages in vertebrate embryos are replaced by in adults.	bones

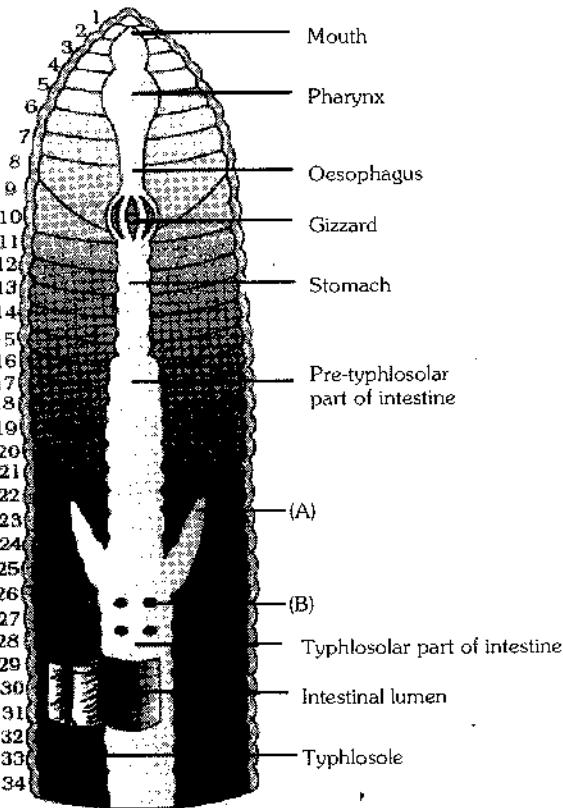
EARTHWORM AND COCKROACH

Q.NO.	QUESTIONS	ANSWERS
1.	<p>Study the given figure of male reproductive system of cockroach. In which of the following part (A, B, C and D) sperms are formed ?</p> 	(A)
2.	How many malpighian tubules present in cockroach ?	100-150
3.	<p>Fill in the blank:- In female cockroach sperms are transferred through _____ by male cockroach?</p>	Spermatophore
4.	<p>Given below the diagram of alimentary canal of cockroach which type of structure responsible for storing of food.</p> 	Crop
5.	In cockroach the respiratory system consists of a network of trachea that open outside the body by the help of	Spiracles

6.	The number of thoracic segments in cockroach are :-	3
7.	The two pairs of wings in cockroach are situated in the segments.	Mesothorax and metathorax
8.	Which one of the following regions of the alimentary canal in <i>Periplaneta</i> is characterised by the presence of a peritrophic membrane.	Mid-gut
9.	In cockroach the nerve cord is :-	Double ventral and solid
10.	In the mouth parts of cockroach the organ of mastication is :-	Mandibles
11.	A ring of 6-8 blind tubules called hepatic or gastric caecae is present at the junction of foregut and mid-gut in cockroach. It secrete the :-	Digestive juices
12.	Which of the following statements are true, which are false for cockroach (1) Sexual dimorphism is distinct (2) The anal styles are present on 9 th sternum of male only (3) In both sexes the 10 th segment bears anal cerci (4) Brain absent in cockroach	(1) → T, (2) → T, (3) → T, (4) → F
13.	Mushroom gland a part of :- (1) Digestive system of cockroach (2) Respiratory system of cockroach (3) Male reproductive system of earthworm (4) Male reproductive system of cockroach	(4)
14.	Which type of structure in cockroach monitoring the environmental conditions :-	Antennae
15.	In male and female cockroach 10 th segment bears a pair of jointed filamentous structure called :-	Anal cerci
16.	Body cavity of cockroach is called :-	Haemocoel
17.	Cockroach mainly excretes :-	Uric acid
18.	In female cockroach, ootheca is secreted by :-	Collateral gland
19.	Egg of cockroach is :-	Centrolecithal
20.	On the basis of metamorphosis the cockroach is :-	Paurometabolus
21.	A dorsal sclerite of cockroach is called :-	Tergum
22.	In cockroach alary muscles are associated with :-	Heart and blood circulation
23.	Young one of the cockroach is called :-	Nymph
24.	The functional units of compound eye of cockroach are called :-	Ommatidia
25.	Ten pairs of spiracles for respiration are present in :-	Cockroach
EARTHWORM = (PHERETIMA POSTHUMA)		
26.	The process of increasing fertility of soil by the earthworms is called :-	Vermicomposting
27.	Septal nephridia of earthworm open in :-	Intestine
28.	In earthworm lateral oesophageal hearts are present in which segments.	12 th and 13 th segments

29.	Structures present only in 7 th and 9 th segments of pheretima posthuma are	Lateral hearts
30.	What is the functions of dorsal blood vessel in pheretima :-	Collection and distribution
31.	In pheretima blood glands are present in which segments.	4 th , 5 th and 6 th segments
32.	The function of blood glands in pheretima.	Production of blood cells and haemoglobin
33.	In pheretima posthuma female genital pore is present in which segment :-	14 th segment
34.	In pheretima posthuma pharyngeal nephridia are present in :-	4 th , 5 th and 6 th segments
35.	Typhlosole of pheretima can be found in :-	Intestine
36.	The typhlosole of earthworm is releated with :-	Absorption
37.	Blood vessel in earthworm which has valve is :-	Dorsal blood vessel
38.	Clitellum of pheretima is primarily concerned with :-	Production of cocoon
39.	Segment having male genital pore in earthworm :-	18 th segment
40.	In pheretima the testis are located in which segments.	10 th and 11 th segments
41.	In pheretima accessory glands are present in which segments :-	17 th and 19 th segments
42.	Given below the diagram of alimentary canal of earthworm. Identify the structure (A) and (B).	(A) = Intestinal caecum (B) = Lymph gland
	 <p>The diagram illustrates the longitudinal section of an earthworm's alimentary canal. The segments are numbered from 1 to 34. The structures labeled are:</p> <ul style="list-style-type: none"> Mouth (1) Pharynx (2) Oesophagus (3) Gizzard (4) Stomach (5) Pre-typhlosolar part of intestine (6) (A) (7) (B) (8) Typhlosolar part of intestine (9) Intestinal lumen (10) Typhlosole (34) 	
43.	In earthworm, which type of structure regulate the volume and composition of the body fluid.	Nephridia

44.	In the garden, earthworm can be traced by their faecal deposits known as :-	Worm castings																				
45.	In earthworm the dorsal surface of the body is marked by a dark median mid-dorsal line called :-	Dorsal blood vessel																				
46.	In earthworm second layer of body wall is made up of :-	Columnar epithelium																				
47.	Arrange the external opening and their segmental number of pheretima :-	A = 3, B = 1, C = 4, D = 2																				
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CELL : THE UNIT OF LIFE

CELL INTRODUCTION

	QUESTIONS	ANSWERS
1.	Who discovered the first living cell ?	Anton Von Leeuwenhoek
2.	Who formulated the cell theory ?	Schleiden and Schwann
3.	Who gave the cell theory a final shape ?	Rudolf Virchow
4.	"Omnis cellula e-cellula" statement was given by :-	Rudolf Virchow
5.	Main arena of various cellular activities of the cell is :-	Cytoplasm
6.	Which non-membranous organelle is found in both prokaryotic and eukaryotic cell ?	Ribosome
7.	Who first explained that cells divide and new cells are formed from pre-existing cells ?	Rudolf Virchow
8.	Which non-membranous cell organelle is found in animal cell and helps in cell division ?	Centriole
9.	Who is responsible for extensive compartmentalisation of cytoplasm in eukaryotic cell ?	Membrane bound cell organelles

FILL IN THE BLANKS

	ANSWERS
1.	Some organisms are composed of a single cell and are called "A" organisms while other organisms are composed of many cells are called "B" organisms.
2.	A British Zoologist, studied different types of animal cells and reported that cells had a thin outer layer which is today known as the plasma membrane.
3.	Cell that has membrane bound nucleus is called "A" whereas cell that lack membrane bound nucleus is called "B".
4.	The largest isolated single cell is the _____.

TRUE / FALSE

	ANSWERS
1.	Anything less than a complete structure of a cell does not ensure independent living
2.	Cell is the fundamental structural and functional unit of living organism
3.	Various chemical reactions occur in the cytoplasm to keep the cell in the living state
4.	All living organisms have a cell wall surrounding the cell membrane
5.	All eukaryotic cells have similar shape
6.	Shape of the cell may vary with the function they perform

CELL WALL		
QUESTIONS		ANSWERS
1.	Middle lamella is mainly composed of :-	Ca-Pectate
2.	In plants other than algae, cell wall is composed of :-	Cellulose, Hemi cellulose, Pectin, Protein
3.	In algae cell wall is composed of :-	Cellulose, galactans, mannan, CaCO_3
FILL IN THE BLANKS		ANSWERS
1.	The cell wall and middle lamella may be traversed by _____ which connect the cytoplasm of neighbouring cells.	plasmodesmata
2.	The cell wall of a young plant cell, the <u>"A"</u> is capable of growth, which gradually diminish as the cell matures and the <u>"B"</u> is formed on the inner side of the cell.	A- primary wall, B- secondary wall
TRUE / FALSE		ANSWERS
1.	Cell wall not only gives shape to the cell, but it protect the cell from mechanical damage & infection	True
2.	As cell mature the secondary wall is formed on the inner (toward membrane) side of the cell	True
3.	Middle lamella holds or glues the different neighbouring animal cells together	False
4.	Cell wall is a living quasifluid structure forms an outer covering for the plasma membrane of fungi and plants	False
5.	All eukaryotic cells are not identical	True
CELL MEMBRANE		
QUESTIONS		ANSWERS
1.	Fluid mosaic model was proposed by :-	Singer & Nicolson
2.	Na^+/K^+ pump is an example of :-	Active transport
3.	The ability of protein to move within the membrane is measured as its :-	Fluidity
4.	Movement of water across the membrane by diffusion is :-	Osmosis
5.	The detailed structural study of cell membrane was possible after the year:-	1950
6.	The cell membrane is composed of lipids that are arranged in :-	Bilayer
7.	In the membrane of human RBC the percentage of lipid is approximately :-	40%
8.	The lipid component of cell membrane mainly consists of :-	Phosphoglycerides
9.	Cell membrane proteins can classified as integral or peripheral on the basis of :-	Ease of extraction

FILL IN THE BLANKS		ANSWERS
1.	According to 'Fluid Mosaic Model', the quasi-fluid nature of <u>a</u> enables the lateral movement of <u>b</u> within the bilayer.	a-lipids, b-proteins
2.	Transport of molecules across the membrane without any requirement of energy is called _____.	passive transport
3.	Neutral solutes can move across the membrane by the process of _____.	Simple diffusion
4.	As <u>a</u> can not pass through the non polar lipid bilayer, they require <u>b</u> to facilitate their transport across the membrane.	a-polar molecules, b-carrier proteins
TRUE / FALSE		ANSWERS
1.	The fluid nature of cell membrane is helpful in functions like :- (A) Formation of intercellular junctions (B) Cell growth (C) Cell division (D) DNA replication (E) Secretion (F) Ribosome synthesis	True True True False True False
2.	The ratio of proteins and lipids is same in all cell membranes	False
3.	The integral proteins are partially or totally burried in the membrane	True
4.	The lipids are arranged in the membrane with the polar heads towards the inner side	False
ER AND GOLGI BODY		
QUESTIONS		ANSWERS
1.	The network of tiny tubular structures scattered in the cytoplasm is called :-	ER
2.	The endoplasmic reticulum bearing ribosomes on its surface is called :-	RER
3.	In 1898 densely stained reticular structure near the nucleus in the nerve cell of owl was first observed by :-	Camillo Golgi
4.	Which cell organelle is the major site for synthesis of lipid ?	SER
5.	Which cell organelle is the important site for synthesis of glycoprotein and glycolipid ?	Golgi apparatus
6.	In animal cells lipid like steroid hormones are synthesised by which cell organelle ?	SER
7.	Diameter of cisternae of Golgi apparatus is :-	0.5 μ m - 1 μ m
8.	Which cellular structures are included in endomembrane system ?	ER, Golgi body, lysosome, vacuole

FILL IN THE BLANKS		ANSWERS
1.	Materials to be packaged in the form of vesicles from the ER fuse with <u>"A"</u> face of Golgi apparatus and move towards the <u>"B"</u> face.	A-cis (forming/convex), B-trans (maturing/concave)
2.	In the absence of ribosomes ER appear smooth and are called _____.	SER
TRUE / FALSE		ANSWERS
1.	The Golgi apparatus remain in close association with the endoplasmic reticulum	True
2.	RER is extensive and continuous with the inner membrane of nucleus	False
3.	ER divides the intracellular space into luminal and extra luminal part	True
4.	Varied number of cisternae are present in Golgi apparatus	True
5.	Cis and trans face of Golgi apparatus are completely same	False
6.	Golgi apparatus principally perform the function of packaging of materials to be delivered either to the intracellular targets or secreted outside the cell	True
7.	Chloroplast is the part of endomembrane system because its function is same as the mitochondria	False
8.	ER, Golgi body, lysosome and vacuole is included in endomembrane system because their function are coordinated.	True
LYSOSOME & VACUOLE		
QUESTIONS		ANSWERS
1.	Which cell organelle is formed in Golgi apparatus by the process of packaging ?	Lysosome
2.	Which cell structure stores water, sap, excretory product and other materials not useful for the cell ?	Vacuole
3.	Which membrane is responsible for setting up higher concentration of ions in the vacuole as compare to cytoplasm.	Tonoplast
4.	Which structure is responsible for excretion in Amoeba ?	Contractile vacuole
TRUE / FALSE		ANSWERS
1.	Lysosomal vesicles have been found to be very rich in almost all types of hydrolytic enzymes	True
2.	Hydrolytic enzymes present in lysosomes are optimally active at basic pH	False
3.	Hydrolytic enzymes are capable of digesting carbohydrates, proteins, lipids and nucleic acids	True
4.	In plant cells the vacuoles can occupy upto 90% of the volume of the cell	True
5.	In many cells, as in protists, food vacuoles are formed by engulfing the food particles	True

MITOCHONDRIA AND CHLOROPLAST	
QUESTIONS	ANSWERS
1. The inner compartment of mitochondria is called :-	matrix
2. Which organelle perform aerobic respiration in cell ?	Mitochondria
3. Which type of leucoplast store oil and fat ?	Elaioplast
4. Which membrane of chloroplast is more permeable ?	Outer membrane
5. Arrangement of thylakoids like piles of coin is known as :-	grana
6. Which type of ribosomes are found in mitochondria ?	70S
FILL IN THE BLANKS	
ANSWERS	
1. The number of mitochondria per cell is variable depending on the _____ activity of cell.	physiological
2. Mitochondria is typically _____ shaped.	sausage/cylindrical
3. Mitochondrial membranes divide its lumen into two _____ compartments.	aqueous
4. Colour giving pigments are present in _____ type of plastid.	chromoplast
5. Chloroplast contain _____ type of ribosomes	70S
6. Foldings of mitochondrial inner membrane are called _____ a present towards _____ b.	a-cristae, b-matrix
7. Mitochondria divide by _____.	fission
8. Mitochondria's diameter is _____ a and length is _____ b.	a - 0.2-1.0 μm (average 0.5 μm), b - 1.0-4.1 μm
9. In chromoplast fat soluble _____ pigments are present.	carotenoids
TRUE / FALSE	
ANSWERS	
1. Mitochondria store food, waste materials and minerals	False
2. Mitochondria does not produce ATP	False
3. Mitochondria is a single membrane bound structure	False
4. The stroma lamellae connect the thylakoid of different grana	True
5. The space limited by the inner membrane of chloroplast is called stroma	True
6. Mitochondria are the site of both aerobic and anaerobic respiration	False
7. Plastids are found in plants	True
8. Carotene and chlorophyll are fat soluble pigments	True
9. Aleuroplast stores protein	True
10. Chlamydomonas contains 20-40 chloroplasts in a cell	False

RIBOSOME	
QUESTIONS	ANSWERS
1. Ribosomes are the granular structures first observed under the electron microscope as dense particles by :-	George Palade (1953)
2. Which type of ribosomes are present in prokaryotic cells ?	70S
3. What is the function of ribosomes ?	Protein synthesis
4. What is the size of prokaryotic ribosomes ?	15 nm to 20 nm.
5. Several ribosomes may attach to a single mRNA and form a chain, this chain is called :-	polyribosome or polysome
6. What are the two sub units of prokaryotic ribosomes?	50S and 30S
7. Ribosomes are composed of which components?	r-RNA and protein
TRUE / FALSE	
ANSWERS	
1. Sedimentation coefficient is an indirect measurement of density and size	True
2. Microbodies are membrane bound vesicles, that contain various enzymes, are present in both plant and animal cells	True
CILIA AND FLAGELLA, CENTRIOLE	
QUESTIONS	
1. A network of filamentous proteinaceous structures present in the cytoplasm is called :-	cytoskeleton
2. Which cell organelle is surrounded by amorphous pericentriolar material ?	Centriole
3. Cilia and flagella are emerge from centriole - like structure called :-	basal bodies
4. Which small structures of cell work like oars ?	Cilia
5. How many radial spokes are present in internal structure of cilia ?	9
6. In axoneme of cilia how many radially arranged peripheral doublet of microtubules are present ?	9
7. Which cellular structure organisation is like the cartwheel ?	centriole
8. Which cellular structure is responsible for rising of spindle apparatus during cell division in animal cell ?	Centriole
9. In centriole radial spoke is made of :-	protein
10. Arrangement of axonemal microtubules in cilia or flagella is :-	9 + 2
FILL IN THE BLANKS	
ANSWERS	
1. In cilia the central tubules are connected by <u>A</u> and is also enclosed by a <u>B</u> , which is connected to one of tubule of each peripheral doublet by a <u>C</u> :-	A - central bridge B - central sheath C - radial spoke
2. Both the centrioles in a centrosomes lie _____ to each other.	perpendicular
3. In centriole each peripheral fibril is a _____.	triplet
4. The central part of the proximal region of the centriole is proteinaceous and called the <u>"A"</u> , which is connected with tubules of the peripheral triplet by <u>"B"</u> .	A-hub, B-radial spokes

	TRUE / FALSE	ANSWERS
1.	Eukaryotic flagellum is comparatively smaller than cilia	False
2.	Bacteria possess flagella but these are structurally different from that of the eukaryotic flagella	True
3.	The cytoskeleton in a cell is involved in mechanical support and motility	True
4.	In cilia, peripheral doublets are interconnected by radial spoke	False
5.	The electron microscopic study of a eukaryotic cilium shows that they are covered with plasma membrane	True
6.	Centriole is made of nine unevenly spaced peripheral fibrils of tubulin protein	False
	NUCLEUS	
	QUESTIONS	ANSWERS
1.	The interphase has highly extended and elaborate nucleoprotein fibres called :-	chromatin
2.	What is the name of basic protein present in chromatin ?	Histone
3.	What is the approximate length of DNA in a single human cell ?	2.2 metre
4.	Which constriction is essentially present in every chromosome ?	Primary constriction
5.	Other name of primary constriction is	Centromere
6.	Sometimes a few chromosomes have non staining secondary constriction at a constant location, this gives the appearance of a small fragment called the :-	satellite
7.	Nucleus was first described by :-	Robert Brown
8.	Chromatin name was given by :-	Flemming
9.	Space between the two parallel membranes of nucleus is called :-	perinuclear space
10.	The outer membrane of nucleus usually remains continuous with which cell organelle ?	ER
11.	Nucleolus is a main site for synthesis of :-	ribosomal RNA
12.	Give the name of two mature eukaryotic cells that lack nucleus :-	(i) RBC (Erythrocytes) of many mammals (ii) Sieve tube cells
13.	Diameter of space between two parallel membranes of nucleus is :-	10 to 50 nm
14.	The spherical structure present in the nucleoplasm is :-	nucleolus
15.	Metacentric, submetacentric, telocentric and acrocentric chromosomes are classified on the basis of :-	position of centromere
16.	Name the type of chromosome which has a terminal centromere :-	Telocentric
17.	In which chromosome the centromere is situated close to its end forming one extremely short and one very long arm ?	Acrocentric
18.	In which chromosome, centromere is situated middle of chromosome and forming two equal arms ?	Metacentric

TRUE / FALSE		ANSWERS								
1.	Nucleus controls the activities of organelles and play a major role in heredity	True								
2.	Material of the nucleus is stained by only acidic dye	False								
3.	Nuclear matrix contains chromatin and one or more spherical bodies called nucleoli	True								
4.	Nuclear pores are the passage through which movement of RNA and protein molecules take place in only one direction	False								
5.	The inner membrane of nucleus usually remain continuous with ER and also bears ribosomes on it	False								
6.	Each and every cell of human body contain nucleus	False								
7.	The content of nucleolus is not continuous with the rest of nucleoplasm because it is bound by single membrane	False								
8.	Larger and more numerous nucleoli are present in cells actively carrying out protein synthesis	True								
9.	Some mature eukaryotic cells lack nucleus but yet these cells consider as a living	True								
10.	In submetacentric chromosomes centromere is situated slightly away from the middle of the chromosome	True								
11.	Secondary constriction essentially present in every chromosome	False								
12.	Chromatin contain DNA, some acidic protein called histone and some non histone protein	False								
13.	Nucleolus is a main site for ribosomal protein synthesis	False								
FILL IN THE BLANKS		ANSWERS								
1.	At a number of places the nuclear envelope is interrupted by minute <u>A</u> , which are formed by the <u>B</u> of its two membranes.	A-pores, B-fusion								
2.	During different stages of cell division, cells show structured <u> </u> in place of the nucleus.	chromosome								
3.	Every chromosome essentially has a <u>"A"</u> on the sides of which disc shaped structures called <u>"B"</u> are present.	A-primary constriction B-kinetochore								
MATCH THE COLUMN		ANSWERS								
1.	Match the Column-I with Column-II	A-iii, B-i, C-ii								
	<table border="1"> <thead> <tr> <th>Column-I</th> <th>Column-II</th> </tr> </thead> <tbody> <tr> <td>A Smallest cell</td> <td>i Nerve cell</td> </tr> <tr> <td>B Longest cell</td> <td>ii Egg of an ostrich</td> </tr> <tr> <td>C Largest isolated single cell</td> <td>iii Mycoplasma</td> </tr> </tbody> </table>	Column-I	Column-II	A Smallest cell	i Nerve cell	B Longest cell	ii Egg of an ostrich	C Largest isolated single cell	iii Mycoplasma	
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C Largest isolated single cell	iii Mycoplasma									

2.

	Column-I		Column-II
A	Schleiden & Schwann	i	Fluid mosaic model
B	Anton Von Leeuwenhoek	ii	Golgi body
C	Singer & Nicolson	iii	Cell theory
D	Robert Brown	iv	Ribosome
E	George Palade	v	First living cell
F	Camillo Golgi	vi	Nucleus

A-iii, B-v, C-i, D-vi, E-iv, F-ii

3.

	Column-I		Column-II
A	Plasmodesmata	i	Holds the different neighbouring cells together
B	Middle lamella	ii	Connect the cytoplasm of neighbouring cells.
C	Primary cell wall	iii	Diminishes as the cell matures

A-ii, B-i, C-iii

4.

	Column-I		Column-II
A	Vacuole	i	Protein synthesis and secretion
B	Lysosome	ii	Packaging of materials
C	Golgi body	iii	Digestion
D	SER	iv	Storage of water
E	RER	v	Synthesis of steroid hormones

A-iv, B-iii, C-ii, D-v, E-i

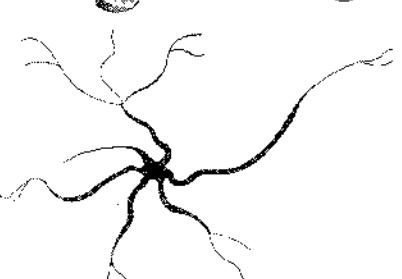
5.

Consider the cell membrane and match the column-I with column-II

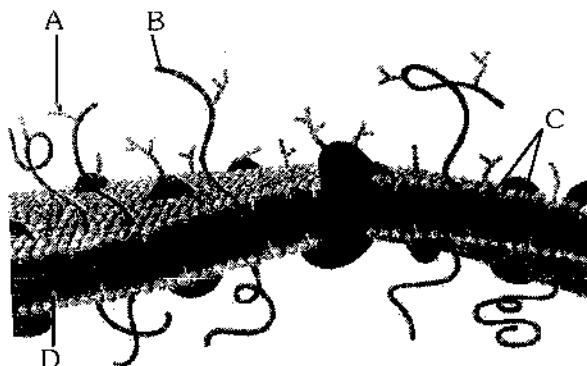
	Column-I		Column-II
A	Lipid	i	52%
B	Protein	ii	40%
C	Fluid mosaic model	iii	Na^+/K^+ pump
D	Active transport	iv	1972

A - ii, B - i, C - iv, D - iii

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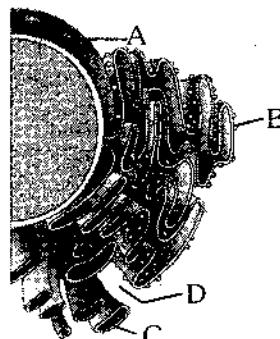
DIAGRAM BASED QUESTIONS		ANSWERS
1.	<p>Identify the following cells :-</p> <p>(A) </p> <p>(B) </p> <p>(C) </p> <p>(D) </p> <p>(E) </p> <p>(F) </p>	<p>(A) Red Blood cells (B) White blood cells (C) Columnar epithelial cells (D) Nerve cell (E) Tracheid (F) Mesophyll cells</p>

2. Given below is the diagram of plasma membrane. Identify the parts labelled A,B,C,D & E.



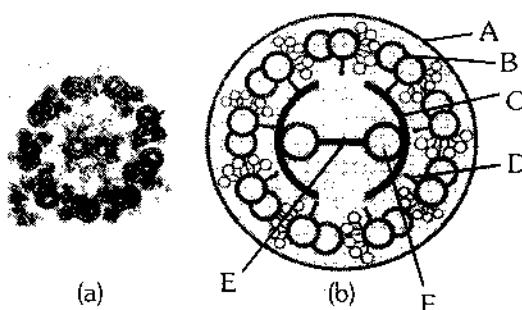
A	Sugar
B	Protein
C	Lipid bilayer
D	Cholesterol
E	Integral Protein

3. From the given figure identify the A,B,C and D



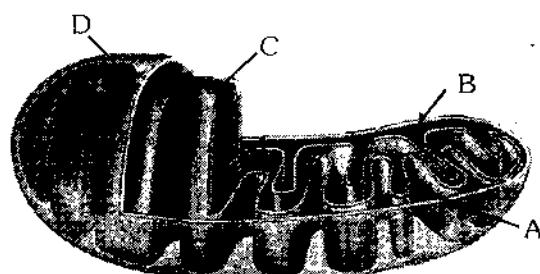
A - Nuclear pore
B - Ribosome (RER)
C - SER
D - Cytoplasm

4. From the given figure identify the A,B,C,D,E and F



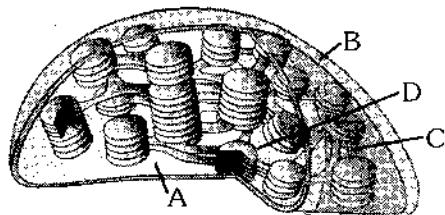
A - Plasma membrane
B - Peripheral microtubule
C - Central sheath
D - Radial spoke
E - Central bridge
F - Central microtubule

5. From the given figure identify A, B, C and D



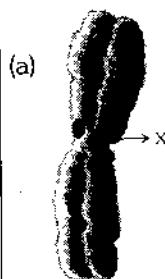
A - Cristae
B - Intermembrane space
C - Inner membrane
D - Outer membrane

6. From the given figure identify A, B, C and D -

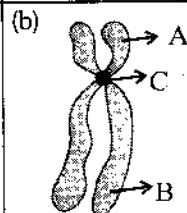


A - Stroma
B - Outer membrane
C - Stroma lamella
D - Thylakoid

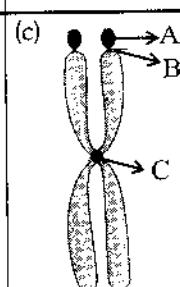
7. Identify the parts labelled in given diagrams :-



X - Kinetochore



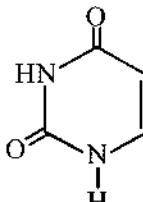
A → Short arm,
B → Long arm,
C → Centromere



A → Satellite
B → Secondary Constriction
C → Centromere

BIOMOLECULE

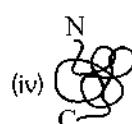
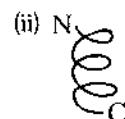
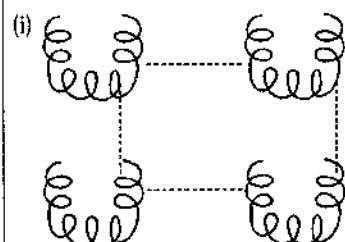
Q.NO.	QUESTIONS	ANSWERS																				
1.	For the extraction of biomolecule from living tissue. This tissue has to be grind in which chemical ?	Trichloroacetic acid (Cl_3CCOOH)																				
2.	If the tissue is fully burnt the remaining ash contain _____.	Inorganic elements																				
3.	In amino acid, the central carbon which contains an amino group and acidic group is called _____.	α -carbon																				
4.	Amino acids are substituted _____.	Methanes																				
5.	A variable group is attached on α -carbon in amino acid called _____.	-R group																				
6.	How many amino acids are used in protein synthesis ?	20																				
7.	If the -R group in proteinaceous amino acid is hydrogen then the amino acid is _____.	Glycine																				
8.	Find the name of following amino acid $ \begin{array}{c} \text{COOH} \\ \\ \text{H}-\text{C}-\text{NH}_2 \\ \\ \text{CH}_2-\text{OH} \end{array} $	Serine																				
9.	Match the columns <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th style="text-align: center;">A</th> <th></th> <th style="text-align: center;">B</th> </tr> </thead> <tbody> <tr> <td>(i)</td> <td>Glutamic acid</td> <td>(a)</td> <td>Basic amino acid</td> </tr> <tr> <td>(ii)</td> <td>Valine</td> <td>(b)</td> <td>Acidic amino acid</td> </tr> <tr> <td>(iii)</td> <td>Lysine</td> <td>(c)</td> <td>Neutral amino acid</td> </tr> </tbody> </table>		A		B	(i)	Glutamic acid	(a)	Basic amino acid	(ii)	Valine	(b)	Acidic amino acid	(iii)	Lysine	(c)	Neutral amino acid	(i)-b, (ii)-c, (iii)-a				
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11.	$\text{NH}_3^+ \text{CH}(\text{R})\text{COO}^-$ given structure represent which form of amino acid?	Zwitter ionic form																				
12.	Lipids are generally _____ in water (soluble / insoluble)	Insoluble																				
13.	A fatty acid has two groups, -R group and _____.	Carboxyl group (-COOH)																				

27.	Identify the following compound 	Uracil N-base (pyrimidine)																				
28.	Match the columns <table border="1" data-bbox="357 684 944 954"> <thead> <tr> <th></th> <th>(A)</th> <th></th> <th>(B)</th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Pigment</td> <td>(i)</td> <td>Morphine</td> </tr> <tr> <td>(b)</td> <td>Toxin</td> <td>(ii)</td> <td>Ricin</td> </tr> <tr> <td>(c)</td> <td>Drug</td> <td>(iii)</td> <td>Carotenoids</td> </tr> <tr> <td>(d)</td> <td>Alkaloids</td> <td>(iv)</td> <td>Vinblastin</td> </tr> </tbody> </table>		(A)		(B)	(a)	Pigment	(i)	Morphine	(b)	Toxin	(ii)	Ricin	(c)	Drug	(iii)	Carotenoids	(d)	Alkaloids	(iv)	Vinblastin	(a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)
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29.	Molecular weight of biomicromolecule approx _____. (Less than 1000 dalton/more than 1000 dalton)	Less than 1000 dalton																				
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31.	In a polypeptide chain amino acids are linked together by which bond ?	Peptide bond																				
32.	Most abundant protein in animal world is _____.	Collagen																				
33.	Polysaccharide that acts as store house of energy in plant tissue is _____.	Starch																				
34.	Inulin is a polymer of _____.	Fructose																				
35.	True/ False (i) A protein is a homopolymer not a heteropolymer (ii) RUBISCO is the most abundant protein in the whole biosphere (iii) Cellulose is a homopolymer (iv) In polysaccharide chain (glycogen) the right end is called non reducing end (v) Starch has helical structure and it given iodine test (vi) Cellulose contains a complex helical structure and can hold I_2 (vii) Chitin is a heteropolymer	False True True False True False False																				
36.	Exoskeleton of Arthropods is made up of _____.	Chitin																				

37.	deoxyribose sugar is present in _____.	DNA
38.	Peptide bonds are formed between which groups of amino acids ?	-COOH & -NH ₂
39.	The glycosidic bonds of polysaccharide are formed by which process ?	Dehydration synthesis
40.	The backbone of DNA chain is formed by _____.	Sugar-phosphate-sugar chain
41.	How many steps are involved in one complete turn of B-DNA ?	10
42.	The distance per base pair in B-DNA is _____.	3.4 Å
43.	Which structure provides the positional information of amino acid in a protein ?	Primary structure
44.	The first amino acid in peptide chain is also called _____.	N-Terminal amino acid
45.	Which protein form is necessary for the many biological activities?	Tertiary structure
46.	When more than one polypeptide chains of tertiary structure are assembled together then called _____.	Quaternary structure
47.	In adult human haemoglobin, how many protein chains are present?	4 chains (2 α & 2 β)
48.	Guanine is always base pair with _____.	Cytosine
49.	Give one example of sulphur containing amino acid	Cysteine

50. Match the following protein structure with their name

(A) Structures



A	B
i	d
ii	b
iii	a
iv	c

(B) Name

(a) Primary structure
 (c) Tertiary structure

(b) Secondary structure
 (d) Quaternary structure

FILL IN THE BLANKS

ANSWERS

1. Some nucleic acids that behave like enzymes, are called _____.

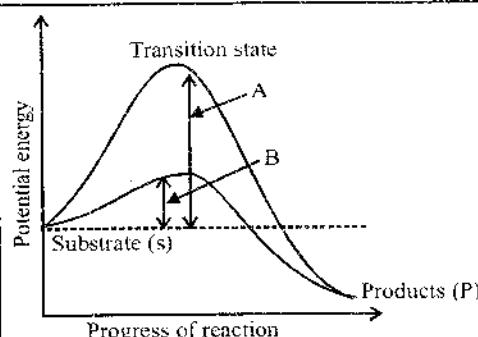
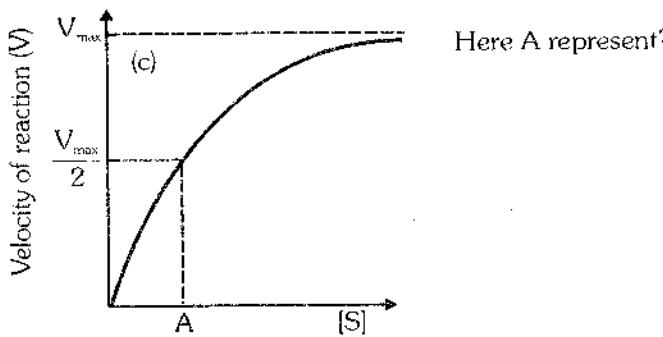
Ribozymes

2. An active site of an enzyme is a _____ into which the substrate fits.

crevice or pocket

3.	Inorganic catalysts work efficiently at _____, while enzymes get damaged at _____.	High temperature, high temperature
4.	_____ is thus an important quality of those enzymes which are isolated from thermophilic organisms.	Thermal stability
5.	The substrate has to diffuse towards the 'active site.' There is thus, an _____ formation of a 'ES' complex.	Obligatory
6.	Inhibition of succinic dehydrogenase by malonate which closely resembles the substrate _____ in structure.	Succinate
7.	All enzymes catalysing inter-conversion of optical, geometric or positional isomers, are known as _____.	Isomerases
8.	Prosthetic groups are _____ compounds and are distinguished from other cofactor in that they are _____ bound to the apoenzyme.	organic, tightly
9.	High temperature destroys enzymatic activity because proteins are _____ by heat.	Denatured
10.	When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as _____.	competitive inhibitor
11.	Enzymes catalysing the linking together of two compounds are known as _____.	Ligases
12.	Haem is the prosthetic group in _____ and _____, which catalyse the breakdown of hydrogen peroxide to water and oxygen.	Peroxidase, catalase
13.	Enzymes are divided into _____ classes each with _____ subclasses and named according by a _____ digit number.	6, 4-13, four
14.	Each enzyme shows the highest activity at a particular temperature and pH called the _____ temperature and _____ pH respectively.	optimum, optimum
15.	During the state where substrate is bound to the enzyme active site, a new structure of the substrate called _____ structure is formed.	Transition state
16.	Enzymes eventually bring _____ the activation energy barrier making the transition of 'S' to 'P' more easy.	Down
	TRUE/FALSE	ANSWERS
1.	Rate can also be called velocity if the direction is specified.	True
2.	Co-factor play a crucial role in the catalytic activity of the enzyme.	True
3.	Transferases catalysing a transfer of hydrogen between a pair of substrate S and S'.	False

4.	Co-enzymes are organic compounds but their association with the apoenzyme is only transient.	True
5.	Zinc is a cofactor for the proteolytic enzyme carboxypeptidase.	True
6.	The power of enzymes is increadible indeed.	True
7.	In our skeletal muscle under aerobic conditions, lactic acid is formed.	False
8.	Almost all enzymes are proteins.	True
9.	Stability is something related to energy status of the molecules or the structure.	True
10.	Coenzyme nicotinamide adenine dinucleotide (NAD) and NADP contain the vitamin niacin.	True
QUESTION		ANSWERS
1.	Which enzymes catalyse hydrolysis of ester, ether, peptide and glycosidic bonds?	Hydrolases
2.	Which enzymes catalyse, removal of groups from substrates by mechanisms other then hydrolysis leaving double bonds?	Lyases
DIAGRAM BASED QUESTIONS		ANSWERS



CELL CYCLE AND CELL DIVISION

INTRODUCTION		
QUESTIONS		ANSWERS
1.	Duration of cell cycle in yeast :-	90 minutes
2.	The phase when the actual cell division occurs :-	M-phase
3.	The phase between two successive M-phase :-	Interphase
4.	The phase corresponding to the interval between mitosis and initiation of DNA replication :-	G_1 phase
5.	The phase which marks the period during which DNA synthesis or replication takes place :-	S-phase
6.	The cells that do not divide further exit G_1 phase and enter in an inactive stage called :-	Quiescent / G_0 stage
7.	In plant, mitotic cell division is seen in the :-	Diploid cells and haploid cells
FILL IN THE BLANKS		ANSWERS
1.	_____ of cell cycle can vary from organism to organism and also from cell type to cell type.	Duration
2.	The interphase lasts more than _____ of the duration of cell cycle :-	95%
3.	The M-phase starts with (a) corresponding to separation of daughter chromosomes and usually ends with division of cytoplasm called (b) :-	a- Karyokinesis, b-cytokinesis
4.	The interphase is the time during which the cell is preparing for division by undergoing both (a) and (b) in an orderly manner :-	a-cell growth, b-DNA Replication
5.	If the initial amount of DNA is denoted as 2C then it increases to _____ in S-phase :-	4C
6.	If the cell had diploid or 2n number of chromosomes at G_1 then after S-phase the number of chromosomes will be _____	Same (2n)
7.	In animal cells, during S-phase (a) begins in the nucleus and (b) duplicates in the cytoplasm	a-DNA Replication, b-Centriole
8.	Cells in G_0 stage remain _____ but no longer proliferate unless called on to do so	metabolically active
TRUE OR FALSE		ANSWERS
1.	In 24 hour average duration of cell cycle of a human cell, cell division proper lasts for only about an hour.	True
2.	Cell growth is a continuous process while DNA replication occurs only during one specific stage in the cell cycle.	True
3.	During prophase, proteins are synthesized in preparation for mitosis.	False

MITOSIS	
QUESTIONS	ANSWERS
1. Most dramatic period of cell cycle is -	M-phase
2. Which stage of mitosis marked by initiation of condensation of chromosomal materials ?	Prophase
3. In which stage of mitosis morphology of chromosome is most easily studied ?	Metaphase
4. The stage of mitosis in which splitting of centromeres occurs -	Anaphase
5. The stage in which nuclear envelope and nucleolus reforms -	Telophase
6. What is the simple precursor or of middle lamella ?	Cell plate
7. The type of division responsible for the growth of multicellular organisms -	Mitosis
8. At which phase of mitosis, chromatids move to opposite poles	Anaphase
9. Give a suitable example of multinucleate condition (syncytium) in which karyokinesis is not followed by cytokinesis ?	Liquid endosperm in coconut
FILL IN THE BLANKS	
1. The number of chromosomes in the parent and progeny cells are same in _____ division.	Mitosis
2. Chromosomes are moved to spindle equator in _____ stage.	Metaphase
3. Two sister chromatids are held together by the _____ of the chromosome.	Centromere
4. Each chromosome move away from the equatorial plate in _____ stage.	Anaphase
5. Mitosis is usually restricted to the _____ cells in animals.	Diploid
6. Mitosis is also known as _____.	Equational division
7. (a) attach to (b) of chromosomes in (c) stage.	(a) Spindle fibres (b) Kinetochores (c) Metaphase
8. Nucleolus, Golgibody and endoplasmic reticulum disappear during (a) stage and reform during (b) stage.	(a) Prophase (b) Telophase
TRUE OR FALSE	
1. Mitosis is also called as reductional division.	False
2. Centriole begins to move towards opposite poles of the cell in anaphase.	False
3. Condensation of chromosomes is completed in metaphase.	True
4. Small disc shaped structures at the surface of centromeres are called Chiasmata.	False
5. Each chromosome start to moves away from equatorial plate in telophase.	False
6. M-phase is the longest phase of cell cycle because karyokinesis occur in this phase.	False
7. In telophase stage chromosomes decondense and lose their individuality.	True

MEIOSIS																						
QUESTIONS		ANSWERS																				
1.	In which stage of meiosis, homologous chromosomes separate while sister chromatids remain associated at their centromeres :-	Anaphase I																				
2.	Pairing of homologous chromosomes occurs in :-	Zygotene																				
3.	Complex structure formed during synapsis is called :-	Synaptonemal complex																				
4.	Enzyme required for crossing over :-	Recombinase																				
5.	Dissolution of synaptonemal complex occur in :-	Diplotene																				
6.	X-shaped structure (Chiasmata) appear in :-	Diplotene																				
7.	Terminalisation of chiasmata occur in :-	Diakinesis																				
8.	Which stage represent transition to metaphase in meiosis-I ?	Diakinesis																				
FILL IN THE BLANKS		ANSWERS																				
1.	Crossing over is the exchange of genetic material between _____ chromatids of homologous chromosomes.	Non-sister																				
2.	In oocytes of some vertebrates _____ stage can last for months or years.	Diplotene																				
3.	During _____ stage nuclear membrane and nucleolus reappear, cytokinesis follows and two cells are formed called dyad of cells.	Telophase-I																				
4.	During _____ stage bivalent chromosomes clearly appear as a tetrad.	Pachytene																				
5.	The stage between meiosis-I and meiosis-II is called _____ and is generally short lived.	Interkinesis																				
TRUE OR FALSE		ANSWERS																				
1.	Meiosis ensures the production of haploid phase in the life cycle of sexually reproducing organisms.	True																				
2.	During interphase the chromosomes become gradually visible under the light microscope.	False																				
3.	Recombination between homologous chromosomes is completed by the end of pachytene.	True																				
4.	Increase in the genetic variability in population of organisms from one generation to next occurs by meiosis.	True																				
5.	At the end of meiosis-I, four haploid daughter cells are formed.	False																				
MATCH THE COLUMN		ANSWERS																				
1.	Match the column-I and column II :-	1-b, 2-c, 3-d, 4-a																				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Column-I</th> <th></th> <th style="text-align: center;">Column-II</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Centriole duplication</td> <td>a</td> <td style="text-align: center;">G_2-phase</td> </tr> <tr> <td>2</td> <td>Quiescent stage</td> <td>b</td> <td style="text-align: center;">S-phase</td> </tr> <tr> <td>3</td> <td>Interval between M-phase and S-phase</td> <td>c</td> <td style="text-align: center;">G_0-phase</td> </tr> <tr> <td>4</td> <td>Second gap phase</td> <td>d</td> <td style="text-align: center;">G_1-phase</td> </tr> </tbody> </table>		Column-I		Column-II	1	Centriole duplication	a	G_2 -phase	2	Quiescent stage	b	S-phase	3	Interval between M-phase and S-phase	c	G_0 -phase	4	Second gap phase	d	G_1 -phase	
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3	Interval between M-phase and S-phase	c	G_0 -phase																			
4	Second gap phase	d	G_1 -phase																			

2.

	Column-I		Column-II
1	Duration of M-phase	a	S-phase
2	DNA replication	b	5%
3	Duration of Interphase	c	G ₀ -stage
4	Metabolically active cells but no longer proliferation	d	95%

1-b, 2-a, 3-d, 4-c

3.

	Column-I		Column-II
A	Interphase	i	Condensation of chromosomal material
B	Prophase	ii	Chromatids move to opposite poles
C	Anaphase	iii	Spindle fibres attach to kinetochores of chromosomes
D	Metaphase	iv	Resting phase

A-iv, B-i, C-ii, D-iii

4.

	Column-I		Column-II
A	Telophase	i	Centriole move to opposite poles
B	Metaphase	ii	Golgi complex and ER reform
C	Anaphase	iii	Chromosome aligned at metaphase plate
D	Prophase	iv	Splitting of centromeres

A-ii, B-iii, C-iv, D-i

5.

	Column-I		Column-II
1	Crossing over	a	Pachytene
2	Synapsis	b	Anaphase-II
3	Chiasmata appear	c	Diakinesis
4	Division of centromere	d	Zygotene
5	Terminalisation of chiasmata	e	Diplotene

1-a, 2-d, 3-e, 4-b, 5-c

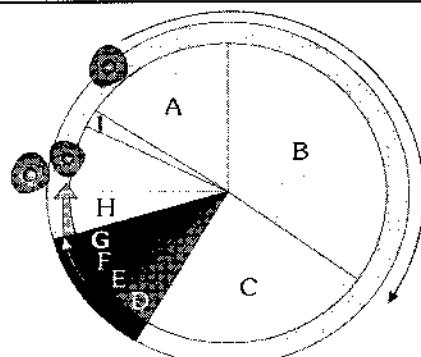
6.

	Column-I		Column-II
I	Mitosis	a	Evolution
II	Meiosis	b	Cell repair
		c	Genetic variability
		d	Replacement of old cells
		e	Growth of multicellular organisms.
		f	Conservation of specific chromosome number of each species

I - b, d, e

II - a, c, f

1.



Answer the following questions regarding the events carried out in the labelled parts of the above given diagram.

- (1) DNA synthesis occurs in
- (2) Condensation of chromosomal material takes place in
- (3) Attachment of spindle fibres to kinetochores of chromosomes during
- (4) Initiation of the assembly of mitotic spindle during
- (5) Splitting of centromere and separation of chromatids in
- (6) Movement of chromatids to opposite poles during
- (7) Reformation of nucleolus, Golgi complex and ER occurs in
- (8) Alignment of chromosomes along metaphase plate during
- (9) Division of cytoplasm during
- (10) Preparation of cell division takes place during

B

D

E

D

F

F

G

E

H

A, B, C

2.

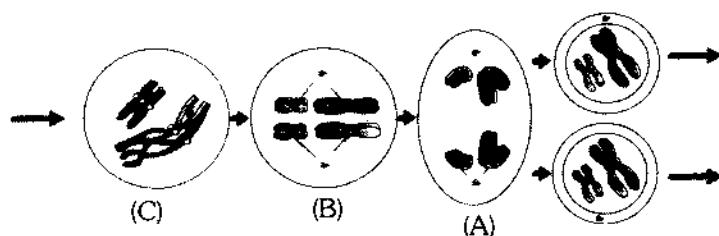
Match the following column-I and column II :-

	Column-I		Column-II
I		(a)	Metaphase
II		(b)	Late prophase
III		(c)	Transition to metaphase
IV		(d)	Anaphase
V		(e)	Telophase

I - (b)
II - (a)
III - (d)
IV - (e)
V - (c)

3.

Identify the following figures :-



(A) Anaphase-I
(B) Metaphase-I
(C) Prophase-I

1. TRANSPORT IN PLANTS

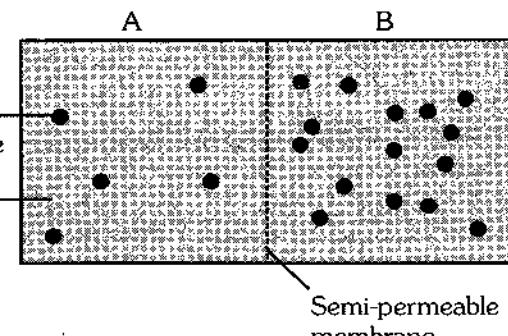
QUESTIONS	ANSWERS
1. What kind of substances are need to be transport in flowering plants?	Water, mineral nutrients, organic nutrients and plant growth regulators
2. Transport over long distances proceeds through the vascular tissues (xylem and phloem) and is called.	Translocation
3. What kind of parameter(s) affect(s) the rate of diffusion.	i = concentration gradient, ii = membrane permeability, iii = temperature iv = pressure
4. Movement of hydrophilic substances according to the concentration gradient with the help of membrane proteins without expenditure of energy is called	Facilitated diffusion
5. Water channels are made up of different types of	Aquaporins
6. Proteins that form huge pores in the outer membrane of the plastids, mitochondria and some bacteria allowing molecules upto the size of small proteins to pass through, are	Porins
7. When all the protein transporters are being used (saturation) then transport rate reaches at its	maximum
8. A transport which is carried out by membrane proteins and uses energy to pump molecules against a concentration gradients is	Active transport
9. Which are the two main components that determine water potential?	(i) Solute potential (ii) Pressure potential
10. What is water potential of pure water at standard temperatures which is not under any pressure.	Zero (0)
11. Lowering in magnitude of water potential due to dissolution of a solute is called.	Solute potential (ψ_s)
12. For a solution at atmospheric pressure, ψ_w (water potential) is equal to	Solute potential (ψ_s)
13. When water enters a plant cell due to diffusion causing a pressure built against the cell wall makes it turgid. This increases the	Pressure potential
14. Which causes the negative pressure potential in xylem ?	Transpiration pull
15. If a pressure greater than atmospheric pressure applied to pure water or a solution then water potential	Increases
16. What is the relation between water potential, solute potential, and pressure potential	$\psi_w = \psi_s + \psi_p$
17. Diffusion of water across a differentially or semi-permeable membrane is known as	Osmosis

18.	What occupies the space between the cell wall and the shrunken protoplast in the plasmolysed cell?	Hypertonic solution
19.	The pressure which is responsible for enlargement and extension of cells is	Turgor pressure
20.	What would be the ψ_p of a flaccid cell?	Zero (0)
21.	The pressure responsible for emerge out of seedlings from the soil is	Imbibition pressure.
22.	For imbibition the parameter(s) which are required between the adsorbant and the liquid imbibed.	(i) Water potential gradient (ii) Affinity
23.	The movement of a molecule across a typical plant cell (about $50\mu\text{m}$) takes approximately 2.5S. At this rate calculate how many years it would take for the movement of molecules over a distance of 1m within a plant by diffusion alone?	1.58×10^{-3} year
24.	Movement of substances in bulk or en mass from one point to another as a result of pressure differences between the two points is called	Mass flow or Bulk flow
25.	The bulk movement of substances through the conducting or vascular tissues of plants is called.	Translocation
26.	Movement of chloroplast due to cytoplasmic streaming can be observed in	Cells of hydrilla leaf
27.	Endodermis is impervious to water because of a band of suberised matrix called.	Casparian strip
28.	What is the symbiotic association of a fungus with a root system of higher plants.	Mycorrhiza
29.	Name a plant seed having obligate association with the mycorrhiza means that can not germinate and establish without the presence of mycorrhiza.	Pinus seeds
30.	As various ions from the soil are actively transported into the vascular tissues of roots, then water follows (it's potential gradient) and increase the pressure inside the xylem. This positive pressure is called.	Root pressure
31.	Excess water collects in the form of droplets around special openings of veins near the tip of grass blades and leaves of many herbaceous parts. Such water loss is known as	Guttation
32.	From which compound plants obtain their carbon and most of their oxygen.	CO_2
33.	In root endodermis, layer of which substance provide ability to actively transport ions in one direction only.	Suberin

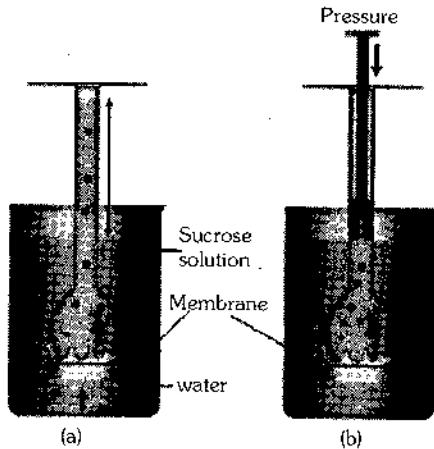
34.	The chief sinks for the mineral elements in plants are	Growing regions of the plant (eg. apical and lateral meristems, young leaves, developing flowers fruits and seeds)																								
35.	From which part mineral ions are frequently remobilised?	Older/senescing parts																								
36.	Write the elements which are most readily mobilised from senescent parts.	Phosphorus, sulphur, nitrogen, potassium and magnesium																								
37.	The main component of phloem sap is	Water and sucrose																								
38.	Which substances are translocated through phloem.	Sugar, hormones and amino acids																								
39.	Which cell's turgidity causes opening or closing of stomata.	Gaurd cells																								
40.	Name the external factors which affect the rate of transpiration	Temperature, light, humidity and Wind speed																								
41.	Plant factors that affect transpiration include	Number and distribution of stomata, percent of open stomata, water status of the plant and canopy structure.																								
42.	The ability of water to rise in thin tubes is known as	Capillarity																								
43.	The phenomenon in which water molecules are attracted to each other in the liquid phase more than to water in the gas phase, is known as	Surface tension																								
44.	An ability to resist a pulling force of water (tensile strength) is depends upon	Cohesion, adhesion and surface tension																								
45.	The accepted mechanism used for the translocation of sugar from source to sink, is called.	Pressure flow hypothesis.																								
46.	Name the experiment which is used to identify tissues from which food is transported.	Girdling experiment																								
47.	Comparison of different mechanisms of transport :-	A = No, B = Yes																								
	<table border="1"> <thead> <tr> <th>Property</th> <th>Simple diffusion</th> <th>Facilitated transport</th> <th>Active transport</th> </tr> </thead> <tbody> <tr> <td>Requires special membrane proteins</td> <td>A</td> <td>B</td> <td>B</td> </tr> <tr> <td>Highly selective</td> <td>A</td> <td>B</td> <td>B</td> </tr> <tr> <td>Transport saturates</td> <td>A</td> <td>B</td> <td>B</td> </tr> <tr> <td>Uphill transport</td> <td>A</td> <td>A</td> <td>B</td> </tr> <tr> <td>Requires ATP energy</td> <td>A</td> <td>A</td> <td>B</td> </tr> </tbody> </table>	Property	Simple diffusion	Facilitated transport	Active transport	Requires special membrane proteins	A	B	B	Highly selective	A	B	B	Transport saturates	A	B	B	Uphill transport	A	A	B	Requires ATP energy	A	A	B	
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Requires ATP energy	A	A	B																							

FILL IN THE BLANKS		ANSWERS
1.	Over small distances substances move by(A)..... and by(B)..... supplemented by(C).....	A = diffusion, B = cytoplasmic streaming, C = active transport
2.	In rooted plants, transport in xylem (of water and minerals) is essentially .....(A)..... from roots to the stems. Organic and mineral nutrients however undergo .....(B)..... transport.	A = Unidirectional B = Multidirectional
3.	When any plant part undergoes senescence .....(A)..... may be withdrawn from such regions and moved to the .....(B).....	A = nutrients B = growing parts
4.	In diffusion molecules move in .....(A)....., the net result being substances moving from regions of .....(B)..... to regions of .....(C)...	A = random fashion B = higher concentration C = lower concentration
5.	Substances .....(A)..... in lipids diffuse through the membrane faster while substances that have a .....(B)..... find it difficult to pass through the membrane.	A = soluble B = hydrophilic moiety
6.	The proteins form channel in the membrane for molecules to pass through. Some channels are .....(A)..... open and others can be .....(B).....	A = always B = controlled
7.	Water is often the limiting factor for plant growth and productivity in both .....(A)..... and .....(B).....	A = agricultural B = natural environments
8.	The greater the concentration of water in a system the greater is its .....(A)..... or .....(B).....	A = kinetic energy B = water potential
9.	Water will move from the system containing water at .....(A).... to the one having .....(B).....	A = higher water potential B = low water potential
10.	The more the solute molecules the .....(A)..... is the solute potential (ψ_s)	A = lower (more negative)
11.	The net direction and rate of osmosis depends on both the .....(A)..... and .....(B).....	A = pressure gradient B = concentration gradient
12.	If the external solution balances the osmotic pressure of the cytoplasm then it is said to be .....(A).....	A = isotonic
13.	Cells swell in .....(A)..... and shrink in .....(B).....	A = hypotonic solution B = hypertonic solution
14.	When water moves out from cell then it is first lost from the .....(A)..... and then from the .....(B).....	A = cytoplasm B = vacuole
15.	Bulk flow can be achieved either through a .....(A)..... or a .....(B).....	A = positive hydrostatic pressure gradient (eg. garden hose) B = negative hydrostatic pressure gradient (eg. suction through a straw)
16.	Mass flow of water occurs due to .....(A)..... and .....(B)..... properties of water.	A = adhesive B = cohesive
17.	The .....(A)..... system is the system of interconnected protoplasts. Neighbouring cells are connected through cytoplasmic strands that extend through .....(B).....	A = symplastic B = plasmodesmata

18.	The fungus provides .....(A)..... to the roots in turn the roots provide .....(B)..... compounds to the fungus.	A = minerals and water B = sugar and N-containing
19.	Effects of root pressure is also observable at .....(A)..... and .....(B)..... when evaporation is low.	A = night B = early morning
20.	The greatest contribution of root pressure is to .....(A)..... the continuous chains of water molecules which often break by .....(B).....	A = re-establish B = transpiration pull
21.	Transpiration is the <u>(A)</u> of water by plants. It occurs mainly through the <u>(B)</u> in the leaves.	A = evaporative loss B = stomata
22.	Normally stomata are <u>(A)</u> in the day time and <u>(B)</u> during the night.	A = open B = close
23.	In the cell walls of the guard cells cellulose microfibrils are oriented <u>(A)</u> rather than <u>(B)</u> making stomata easier to open.	A = radially B = longitudinally
24.	Mutual attraction between water molecules is <u>(A)</u> while attraction of water molecules to polar surfaces (such as the surface of tracheary elements) is called <u>(B)</u> .	A = cohesion B = adhesion
25.	The evolution of the C ₄ photosynthetic system is probably one of the strategies for maximising the availability of <u>(A)</u> while minimising <u>(B)</u> loss.	A = CO ₂ B = water
26.	Most of the minerals enter into the cytoplasm of epidermal cells of root by <u>(A)</u> while some ions move <u>(B)</u> into the epidermal cells.	A = active absorption B = passively
27.	Transport proteins of root endodermal cells are control points where a plant adjusts the <u>(A)</u> and <u>(B)</u> of solutes that reach the xylem.	A = quantity B = types
28.	Unloading of mineral ions occur at the fine vein endings through <u>(A)</u> and <u>(B)</u> by sink cells.	A = diffusion B = active uptake
29.	Some of the nitrogen travels as <u>(A)</u> but much of it is carried in the <u>(B)</u> as amino acids and related compounds.	A = inorganic ions (NO ₃) B = organic forms
30.	During early spring roots act as a <u>(A)</u> of food while buds of trees act as a <u>(B)</u> .	A = source B = sink
31.	The direction of movement in the phloem is <u>(A)</u> while in the xylem movement is always <u>(B)</u> .	A = bi-directional B = unidirectional
TRUE AND FALSE		ANSWERS
1.	Hormones or plant growth regulators and other chemical stimuli are also transported though in very small amounts, sometimes in a strictly polarised or unidirectional manner.	True

2.	Compounds from storage organs are never re-exported.	False
3.	Diffusion is the only means of gaseous movement within the plant body	True
4.	Energy expenditure takes place in diffusion.	False
5.	The diffusion rate depends on the size of the substances.	True
6.	Diffusion is a slow process and is not dependent on a living system.	True
7.	Facilitated diffusion and active transport both shows transport saturation.	True
8.	Like enzymes, carrier proteins are not very specific to respective transport molecules.	False
9.	Facilitated diffusion and active transport both are affected by inhibitors those react with protein's side chain of transporters.	True
10.	Water is essential for all physiological activities of the plant and plays a very important role in all living organisms.	True
11.	The protoplasm of the cells is nothing but water in which different molecules are dissolved and several particles are suspended.	True
12.	Terrestrial plants take up huge amount of water but very less is evaporated from the leaves in transpiration.	False
13.	Most herbaceous plants have only about 10 to 15 percent of it's fresh weight as dry matter	True
14.	Water potential is denoted by the Greek symbol Ψ and is expressed in pressure units such as pascals (Pa).	True
15.	Contents of vacuole does not contribute to the solute potential of the cell	False
16.	<p>Study the given figure carefully and select the true and false statement(s) regarding it.</p>  <p>(a) Solution of chamber B has a lower water potential. (b) Solution of chamber A has a lower solute potential. (c) Osmosis occurs from chamber A to B. (d) Solution of chamber B has a higher solute potential. (e) At equilibrium both chambers have equal water potential. (f) If one chamber has a Ψ of -2000 kPa and the other -1000 kPa then chamber with Ψ of -1000 kPa has the higher Ψ</p>	

17. Study the given figure carefully and select the true and false statement(s) in this demonstration.



(a) Numerically this external pressure in figure (b) is equivalent to the osmotic potential of a solution, but the sign is opposite.
 (b) Osmotic pressure is due to the solute concentration.

True

True

18. Because of the rigidity of cell wall the cell does not rupture.

True

19. The process of plasmolysis is usually irreversible.

False

20. In mass flow substances whether in solution or in suspension are swept along at the same pace as in flowing river.

True

21. Root hairs are thin-walled slender extensions of root epidermal cells that are present in millions of number at the root.

True

22. Water is absorbed alongwith mineral solutes by the root hairs, purely by diffusion.

True

(here please note that osmosis is also a special type of diffusion)

23. Symplastic movement may be aided by cytoplasmic streaming.

True

24. Most of the water flow in the roots occurs via the apoplast since the cortical cells are closely packed

False

25. Most plants meet their need of water transport by root pressure.

False

26. Cohesion-tension-transpiration-pull model explain that water is mainly 'Pulled' through the plant.

True

27. Water is transient in plants, less than 1 percent of the water reaching the leaves is used in photosynthesis and plant growth.

True

28. The inner wall of each guard cell towards the pore or stomatal aperture is thick and elastic

True

29. Transpiration helps to transport minerals from the soil to all parts of the plant.

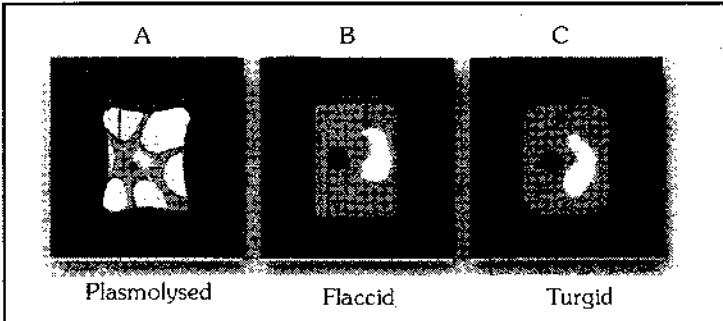
True

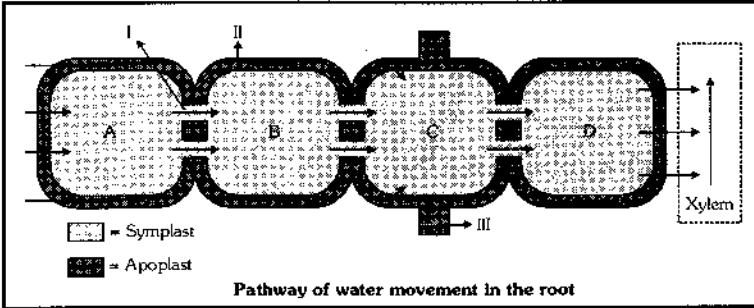
30. Transpiration maintains the shape and structure of the plants by keeping cells turgid.

True

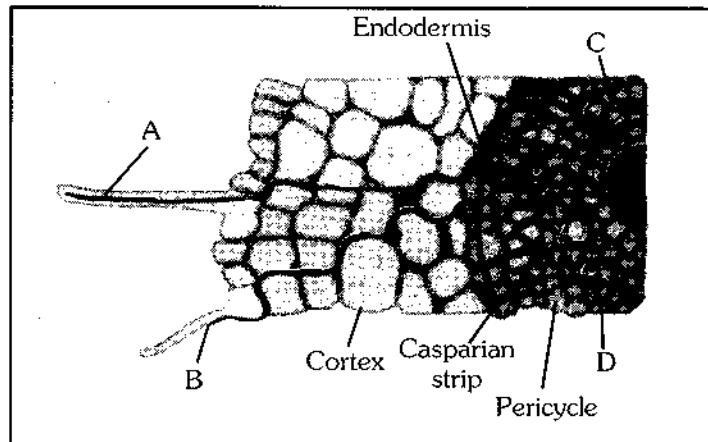
31.	C ₄ plants are twice as efficient as C ₃ plants in terms of fixing carbon (making sugar)	True
32.	C ₄ plant loses only half as much water as a C ₃ plant for the same amount of CO ₂ fixed	True
33.	Minerals are present in the soil as charged particles (ions) which can move across cell membrane easily.	False
34.	The concentration of minerals in the soil is usually lower than the concentration of minerals in the root.	True
35.	Small amounts of P and S are carried as organic compounds.	True
36.	Xylem transports only inorganic nutrients while phloem transports only organic materials.	False
37.	The process of loading at the source produces a hypertonic condition in the phloem.	True
38.	At loading sugars are actively transported in the phloem.	True
39.	Between loading & unloading transport of sugar is assisted by turgor pressure that built up within phloem tissue.	True

DIAGRAM BASED QUESTIONS
ANSWERS

1.	Find the solution A,B and C in which different plant cells are placed.	A = Hypertonic B = Isotonic C = Hypotonic
		

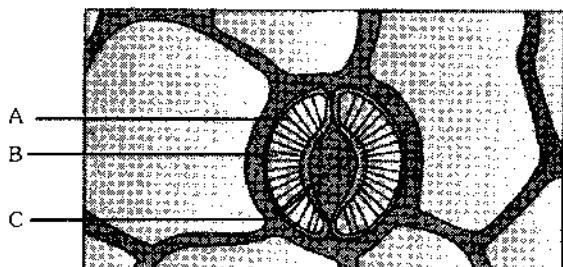
2.	Given figure shows pathway of water movement in the root. Identify the labelled parts and select the right option about them	A = Epidermis B = Cortex C = Endodermis D = Pericycle I = Plasmodesmata II = Cell wall III = Caspary strip
		

3. Identify the correct labelling regarding water and ion absorption and movement in roots.



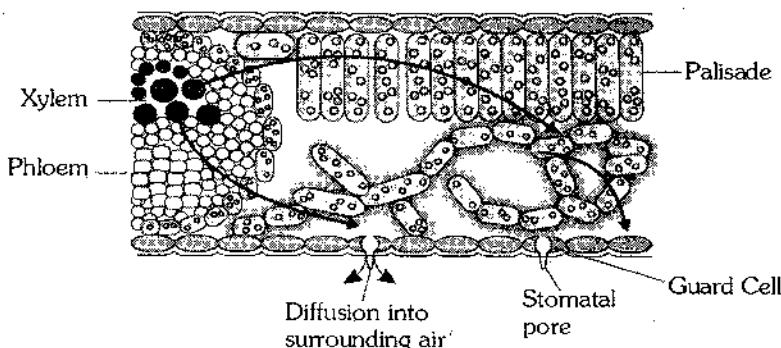
- A = Symplastic path
- B = Apoplastic path
- C = Xylem
- D = Phloem

4. Choose the correct terms for labelled parts in the given figure.



- A = Microfibrils
- B = Guard cell
- C = Stomatal aperture

5. Study the given figure of water movement in the leaf and mark the correct series of pressure gradient that occurs during transpiration.

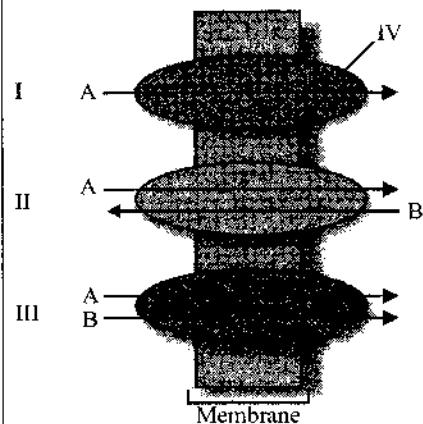


I → II

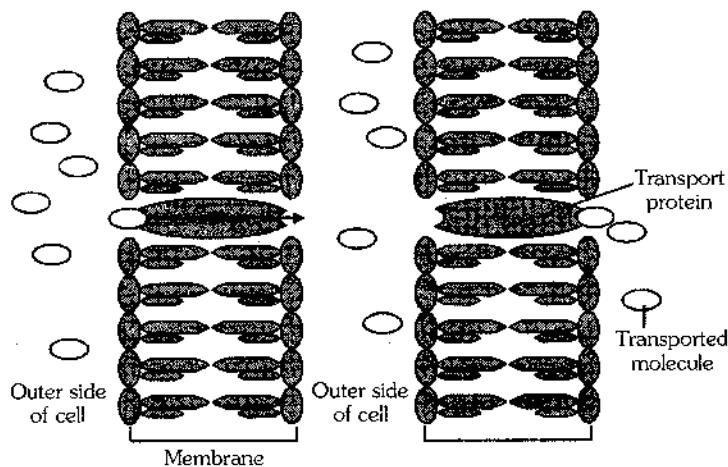
- (I) Pressure gradient between the outside air and the air spaces of the leaf.
- (II) Pressure gradient between photosynthetic cells and on the water filled xylem in the leaf vein.

6.

From the given figure of facilitated diffusion identify I, II, III and IV


I = Uniport
II = Antiport
III = Symport
IV = Carrier protein
7.

Find the mean or method of transport shown in following diagram


Facilitated diffusion
8.

Match the column-I to the column-II

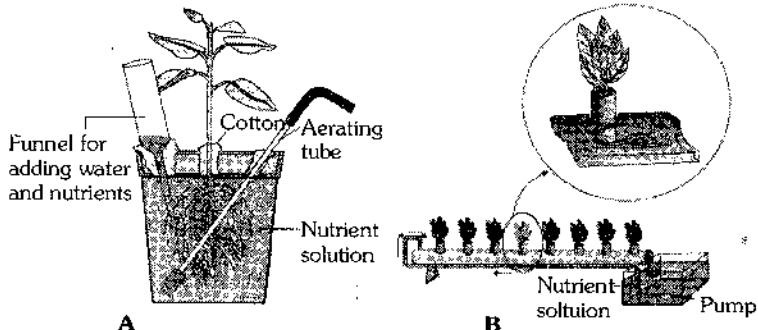
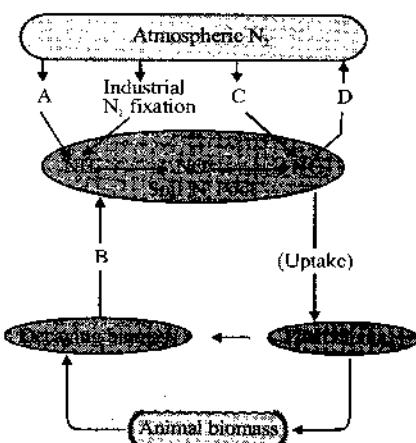
	Column-I		Column-II
A	Xylem	i	Water and mineral salts
B	Phloem	ii	Roots to aerial parts
		iii	Mainly leaves to other parts
		iv	Some organic nitrogen and hormones
		v	Variety of organic and inorganic solutes

A = i, ii, iv
B = iii, iv, v

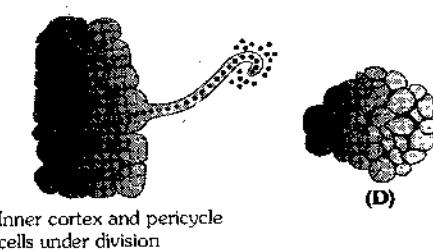
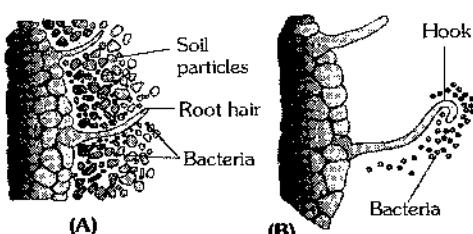
2. MINERAL NUTRITION IN PLANTS

QUESTIONS		ANSWERS
1.	First of all who demonstrate that plants can be grow to maturity in a defined nutrient solution in complete absence of soil ?	Julius von sachs
2.	Technique of growing plants in a nutrient solution is known as	Hydroponics
3.	On what basis plant elements are divided into macronutrients and micronutrients ?	Quantitative requirements
4.	What is the source of carbon hydrogen and oxygen in plants?	CO ₂ and H ₂ O
5.	Find the amount of macronutrients and trace elements that is present in plant tissues.	Macronutrients > 10m mole kg ⁻¹ of dry matter Micronutrients < 10m mole kg ⁻¹ of dry matter
6.	Macronutrients are :-	C,H,O,N,P,S,K,Ca,Mg
7.	Micronutrients are :-	Fe,Mn,Cu,Mo,Zn,B,Cl,Ni
8.	Deficiency symptom of relatively immobile elements (e.g. Ca) first appear in	Young tissue
9.	Deficiency symptom of mobile elements (e.g. N, Mg, K, P) first appear in	Old tissue
10.	The concentration of the essential element below which plant growth is retarded is termed as	Critical concentration
11.	Name the element which is an activator of RuBisCO and PEPcase.	Mg
12.	Any mineral ion concentration in tissues that reduces the dry weight of tissues by about 10% is known as	Toxic concentration
13.	Manganese toxicity causes	Brown spots surrounded by chlorotic veins
14.	Excess of manganese may induce deficiency of	Fe, Mg, Ca
15.	If radioisotopes of minerals are supplied to soil then which vascular tissue helps to translocate them in plant body ?	Xylem
16.	The process of conversion of nitrogen (N ₂) to ammonia is termed as	Nitrogen fixation
17.	Find the name of bacteria in following reactions :- (i) 2NH ₃ + 3O ₂ $\xrightarrow{(A)}$ 2NO ₂ ⁻ + 2H ⁺ + 2H ₂ O (ii) 2NO ₂ ⁻ + O ₂ $\xrightarrow{(B)}$ 2NO ₃ ⁻ (iii) 2NO ₃ ⁻ + 10e ⁻ + 12H ⁺ $\xrightarrow{(C)}$ N ₂ + 6H ₂ O	(A) = <i>Nitrosomonas/Nitrococcus</i> (B) = <i>Nitrobacter</i> (C) = <i>Pseudomonas/Thiobacillus</i>
18.	Nitrifying bacteria are	Chemoautotrophs
19.	The enzyme nitrogenase which is capable of nitrogen reduction present in	Prokaryotes

20.	Name the organisms which are free living but as symbionts can fix atmospheric nitrogen	Rhizobium and Frankia
21.	Frankia form symbiotic association with	Roots of non leguminous plants (eg. <i>Alnus</i>)
22.	Nodules of legume contain an oxygen scavenger called	Leg haemoglobin
23.	How many ATP are required for formation of one NH_3 in biological nitrogen fixation.	8ATP
24.	At physiological pH the ammonia is protonated to form	NH_4^+ (ammonium) ion
25.	Name the given reaction and enzyme involved in it. $\alpha\text{-ketoglutaric acid} + \text{NH}_4^+ + \text{NADPH} \xrightarrow{\text{Enzyme}} \text{glutamate} + \text{H}_2\text{O} + \text{NADP}$	- Reductive amination - Glutamate dehydrogenase
26.	Name the given reaction and enzyme involved in it $\begin{array}{ccc} \text{H} & & \text{H} \\ | & & | \\ \text{R}_1-\text{C}-\text{COO}^- & + & \text{R}_2-\text{C}-\text{COO}^- \rightleftharpoons \text{R}_1-\text{C}-\text{COO}^- & + & \text{R}_2-\text{C}-\text{COO}^- \\ | & & | \\ \text{NH}_3^+ & & \text{O} & & \text{NH}_3^+ \\ \text{Amino donor} & & \text{Amino accepter} & & \end{array}$	- Transamination - Transaminase
27.	Write the two most important amides that are found in plants	Asparagine and glutamine
28.	Name the compounds that have a high nitrogen to carbon ratio and are transported form of nitrogen in some plants.	Ureides
FILL IN THE BLANKS		ANSWERS
1.	Some plant species can accumulate <u>(A)</u> and <u>(B)</u> while some plants growing near nuclear test sites take up <u>(C)</u> .	A = selenium B = gold C = radioactive strontium
2.	Essential element must be absolutely necessary for supporting <u>(A)</u> and <u>(B)</u> .	A = normal growth B = reproduction
3.	The requirement of the essential element must be <u>(A)</u> and not replaceable by another <u>(B)</u> .	A = specific B = element
4.	The movement of ions is usually called flux; the inward movement into the cells is <u>(A)</u> and outward movement is <u>(B)</u> .	A = influx B = efflux
5.	Soil not only supplies <u>(A)</u> but also harbours <u>(B)</u> , other microbes, holds water, supplies air to the roots and acts a <u>(C)</u> that stabilises the plant.	A = minerals B = nitrogen fixing bacteria C = matrix
6.	Nitrogen is a limiting nutrient for both <u>(A)</u> and <u>(B)</u> ecosystems.	A = natural B = agricultural

	TRUE & FALSE	ANSWERS
1.	<p>Study the given figure carefully and select true & false statement regarding it (From i to iv)</p>  <p>A</p> <p>B</p> <p>(i) By this method essential elements were identified and their deficiency symptoms discovered.</p> <p>(ii) This technique can be used for commercial production of vegetables such as tomato, seedless cucumber and lettuce.</p> <p>(iii) From figure A, if aeration tube is removed then growth of plants will not be affected.</p> <p>(iv) In figure B, pump is used to circulate nutrient solution from a reservoir to the elevated end of the tube.</p>	
2.	More than sixty elements of the 105 discovered so far are found in different plants.	True
3.	The essential element must be directly involved in the metabolism of the plant.	True
	DIAGRAM BASED QUESTIONS	ANSWERS
1.	<p>Study the given figure of nitrogen cycle that shows the relationship between the three main nitrogen pools – atmosphere, soil and biomass and find labelled part A, B, C & D</p> 	<p>A = Biological N_2 fixation</p> <p>B = Ammonification</p> <p>C = Electrical nitrogen fixation</p> <p>D = Denitrification</p>

2. Study the given figure which shows the development of root nodules in soyabean. Match the correct explanation and find the correct sequence for labelled diagrams.



Inner cortex and pericycle cells under division

(C)

- (I) Rhizobium bacteria contacting a susceptible root hair.
- (II) A mature nodule having vascular connection with roots.
- (III) Infection thread carrying bacteria to the inner cortex.
- (IV) Curling of root hair due to successful infection.

A-I → B-IV → C-III → D-II

MATCH THE COLUMN

ANSWERS

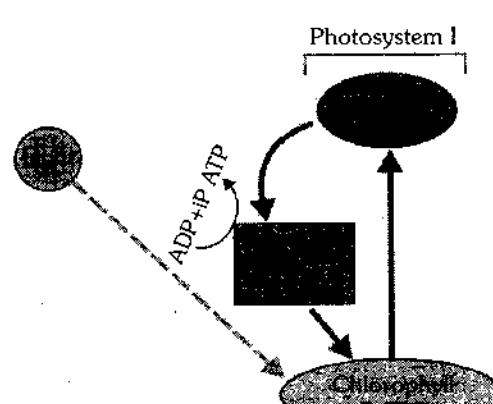
1. Match the column I with column II :-

Column-I	Column-II
(A) Macronutrients	(i) Constituent of thiamine, biotin coenzyme and ferredoxin
(B) Sulphur	(ii) Ring structure of chlorophyll and ribosome structure
(C) Phosphorus	(iii) Required by meristematic and differentiating tissues
(D) Calcium	(iv) Maintain an anion-cation balance
(E) Magnesium	(v) Required for phosphorylation reactions

A-iv, B-i, C-v, D-iii, E-ii

2.	Match the column I with column II :- <table border="0" data-bbox="373 381 1056 740"> <thead> <tr> <th data-bbox="373 381 635 471">Column-I (Micronutrient)</th><th data-bbox="730 381 1056 471">Column-II (Function)</th></tr> </thead> <tbody> <tr> <td data-bbox="309 482 627 516">(A) Iron</td><td data-bbox="690 482 992 516">(i) Nitrogen metabolism</td></tr> <tr> <td data-bbox="309 527 635 561">(B) Manganese & chlorine</td><td data-bbox="690 527 992 561">(ii) Activate carboxylases</td></tr> <tr> <td data-bbox="309 572 436 606">(C) Zinc</td><td data-bbox="690 572 1024 606">(iii) Activate catalase enzyme</td></tr> <tr> <td data-bbox="309 617 436 651">(D) Boron</td><td data-bbox="690 617 976 651">(iv) Photolysis of water</td></tr> <tr> <td data-bbox="309 662 547 695">(E) Molybdenum</td><td data-bbox="690 662 1056 740">(v) Pollen germination and carbohydrate translocation</td></tr> </tbody> </table>	Column-I (Micronutrient)	Column-II (Function)	(A) Iron	(i) Nitrogen metabolism	(B) Manganese & chlorine	(ii) Activate carboxylases	(C) Zinc	(iii) Activate catalase enzyme	(D) Boron	(iv) Photolysis of water	(E) Molybdenum	(v) Pollen germination and carbohydrate translocation	A-iii, B-iv, C-ii, D-v, E-i
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4.	Match the column I with column II :- <table border="0" data-bbox="309 1156 1103 1380"> <thead> <tr> <th data-bbox="373 1156 635 1245">Column-I (Free living nitrogen fixers)</th><th data-bbox="730 1156 1056 1245">Column-II (Organism)</th></tr> </thead> <tbody> <tr> <td data-bbox="309 1257 627 1290">(A) Aerobic microbes</td><td data-bbox="690 1257 1056 1290">(i) <i>Anabaena, Nostoc</i></td></tr> <tr> <td data-bbox="309 1302 627 1335">(B) Anaerobic microbes</td><td data-bbox="690 1302 1056 1335">(ii) <i>Azotobacter, Beijerinckia</i></td></tr> <tr> <td data-bbox="309 1347 627 1380">(C) Cyanobacteria</td><td data-bbox="690 1347 1056 1380">(iii) <i>Rhodospirillum, Bacillus</i></td></tr> </tbody> </table>	Column-I (Free living nitrogen fixers)	Column-II (Organism)	(A) Aerobic microbes	(i) <i>Anabaena, Nostoc</i>	(B) Anaerobic microbes	(ii) <i>Azotobacter, Beijerinckia</i>	(C) Cyanobacteria	(iii) <i>Rhodospirillum, Bacillus</i>	A-ii, B-iii, C-i				
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84														

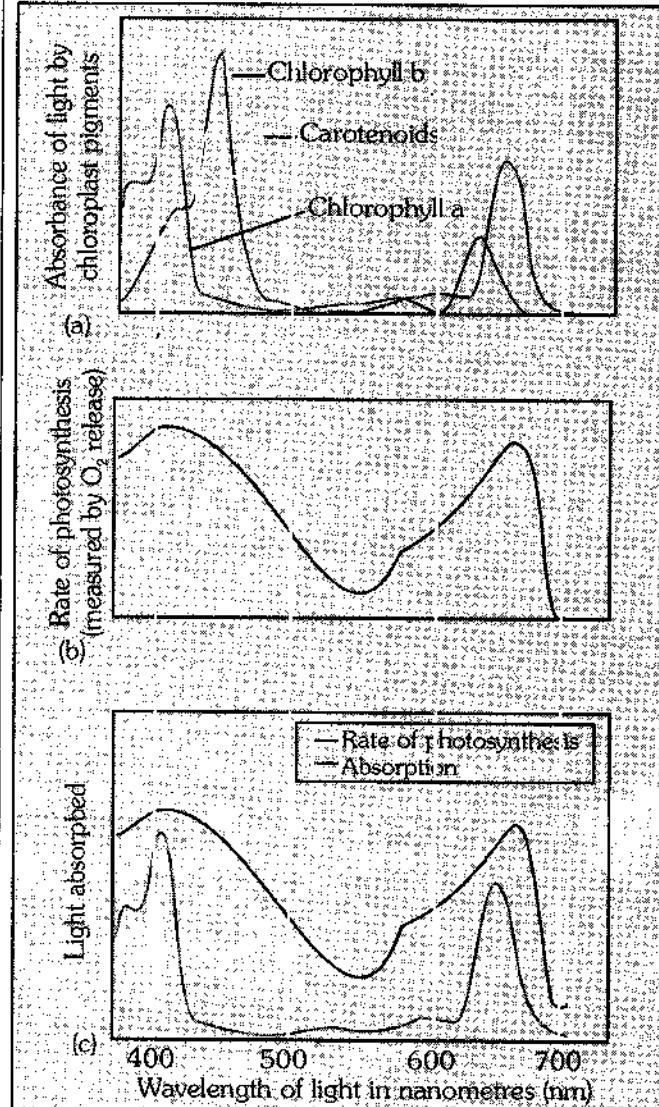
3. PHOTOSYNTHESIS IN HIGHER PLANTS

QUESTIONS	ANSWERS
1. Process in which light energy is converted into chemical energy (organic compounds) is called	Physico-chemical process e.g. Photosynthesis
2. An experimental setup to show that CO_2 is essential for photosynthesis is	Moll's half leaf experiment
3. First of all who demonstrate that sunlight is essential for photosynthesis in plants	Jan Ingenhousz
4. Production of glucose takes place in green part of plant is established by	J.V. Sachs
5. A first action spectrum of photosynthesis was described by	T.W. Engelmann
6. Name the algae which was used to describe action spectrum of photosynthesis	<i>Cladophora</i>
7. Who demonstrate that photosynthesis is a light dependent reaction in which hydrogen from a suitable oxidisable compound reduces carbon dioxide to carbohydrate $2\text{H}_2\text{A} + \text{CO}_2 \xrightarrow{\text{Light}} 2\text{A} + \text{CH}_2\text{O} + \text{H}_2\text{O}$ Also conclude O_2 evolve during photosynthesis comes from water not from carbon dioxide.	C.V. Niel
8. Name the pigment(s) which increases the absorption range for photosynthesis.	Chlorophyll b, xanthophylls and carotenoids
9. Where are the protons and O_2 , formed during splitting of water, likely to be released.	In lumen of thylakoid
10. Synthesis of ATP from ADP and inorganic phosphate in presence of light is known as	Photophosphorylation
11. Identify the A in the given figure of light reaction :- 	A = Electron transport system
12. Write the requirements for chemiosmotic ATP synthesis	Membrane Proton pump Proton gradient ATPase

13.	Name of the place where accumulation of protons occur during chemiosmosis in chloroplast and mitochondria respectively.	Thylakoid lumen and intermembrane space of mitochondria
14.	The phase that leads to synthesis of food (sugar) in photosynthesis is called.	Biosynthetic phase
15.	The first stable product of Calvin cycle is	3-PGA
16.	The first stable product in C ₄ pathway is	OAA
17.	How many Calvin cycles are required for formation of one glucose ?	6 cycles
18.	How many ATP and NADPH will be required to make one glucose through the Calvin pathway ?	18 ATP and 12 NADPH
19.	When in plant leaves, chloroplast containing bundle sheath cells surrounds vascular bundles in several layers that anatomy is known as	Kranz anatomy (C ₄ Plants)
20.	Write the characteristics of bundle sheath cells of C ₄ plants	Large number of chloroplast Thick walls impervious to gaseous exchanges no intercellular spaces
21.	Give the example of C ₄ plants	Sugarcane, Maize and Sorghum
22.	Write the enzyme which is present most abundantly in the world	RuBisCO
23.	For which substrate RuBisCO shows greater affinity ?	CO ₂
24.	Name the products of photorespiration which are the result of O ₂ binding to RuBP	Phosphoglycerate and phosphoglycolate
25.	Name the internal or plant factors that affect the rate of photosynthesis	Number, size, age and orientation of leaves, mesophyll cells, chloroplasts, internal CO ₂ concentration and the amount of chlorophyll
26.	Name the external factors that affect the rate of photosynthesis	Availability of sunlight, temperature, CO ₂ concentration and water
27.	Blackman's law of limiting factor states that if a chemical process is affected by more than one factor, then its rate will be determined by the factor which is nearest to its –	Minimal value (at suboptimal level)
28.	For which plants light is a limiting factor	Plants in shade
29.	Write the concentration of CO ₂ at which C ₃ and C ₄ plants shows saturation respectively.	C ₃ = 450 μL^{-1} C ₄ = 360 μL^{-1}
30.	Among light and dark reaction which reaction is more temperature affected ?	Dark reaction (more enzymatic)
31.	Write the effect of water stress on plants	Reducing the surface area of leaves and metabolic activity and causes stomatal closure.

FILL IN THE BLANKS		ANSWERS
1.	In photosynthesis directly light driven reactions are called <u>(A)</u> while some reactions are depends on the products of light reaction (ATP and NADPH) conventionally called as <u>(B)</u> .	A = light reactions B = dark reactions
2.	Light reaction or the 'Photochemical' phase include <u>(A)</u> , <u>(B)</u> , <u>(C)</u> and formation of <u>(D)</u> .	A = light absorption B = water splitting C = oxygen release D = ATP and NADPH
3.	In PS I the reaction centre chlorophyll a has an absorption peak at 700 nm, hence is called <u>(A)</u> while in PS II it has absorption maxima at 680 nm and is called <u>(B)</u> .	A = P700 B = P680
4.	C_4 plants are special. They have special type of <u>(A)</u> , they tolerate <u>(B)</u> , they show a response to <u>(C)</u> , they lack a process called <u>(D)</u> and have greater <u>(E)</u> .	A = leaf anatomy B = higher temperature C = high light intensities D = photorespiration E = productivity of biomass
5.	In the photorespiratory pathway, there is neither synthesis of <u>(A)</u> nor of <u>(B)</u> . Rather it results in the release of <u>(C)</u> with the utilization of <u>(D)</u> . Therefore, photorespiration is a wasteful process.	A = sugar B = ATP C = CO_2 D = ATP
6.	The plant or internal factors affecting photosynthesis are dependent on the <u>(A)</u> and the <u>(A)</u> of the plant.	A = genetic predisposition B = growth
7.	<u>(A)</u> plants have a higher temperature optimum than the plants adapted to <u>(B)</u> climates.	A = tropical B = temperate
8.	Water stress causes stomata to <u>(A)</u> hence reducing the <u>(B)</u> availability.	A = close B = CO_2
TRUE & FALSE		ANSWERS
1.	By observing given figure mark the statement true or false.	
	<p>By this experiment Priestley hypothesised that plant restore to the air whatever breathing animal and burning candle remove.</p>	True

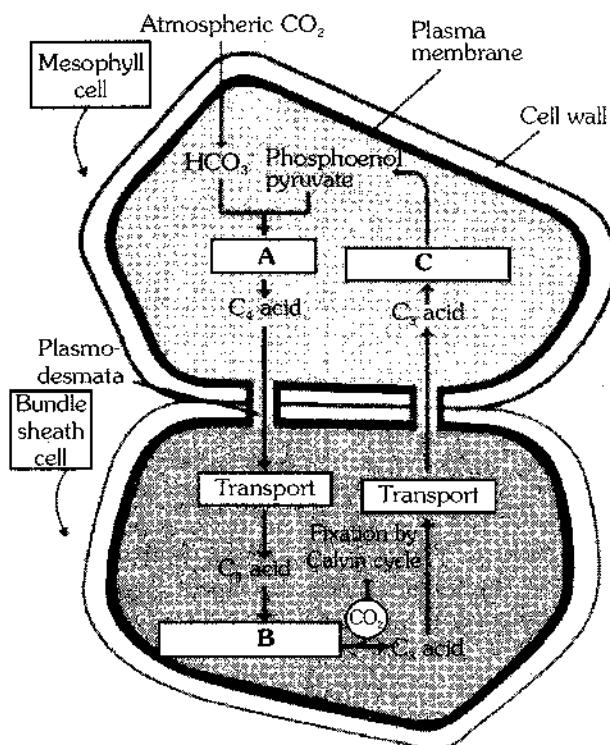
2. Observe the following graphs carefully and select the true or false statement regarding it :-



<ul style="list-style-type: none"> (i) Graph a indicates that at wavelengths of blue and red colour, chlorophyll a shows maximum absorption. (ii) Graph b indicates that at wavelengths of blue and red colour, plants shows maximum rate of photosynthesis. (iii) Graph c indicates complete one to one overlap between the absorption spectrum of chlorophyll a and the action spectrum of photosynthesis. 	True True False
3. Photosystem I (PS I) and photosystem II (PS II) are named in the sequence in which they function during the light reaction.	False
4. The chlorophyll 'a' molecule forms the 'reaction centre' in photosystem	True
5. Calling the biosynthetic phase of photosynthesis as the dark reaction is a misnomer.	True

6.

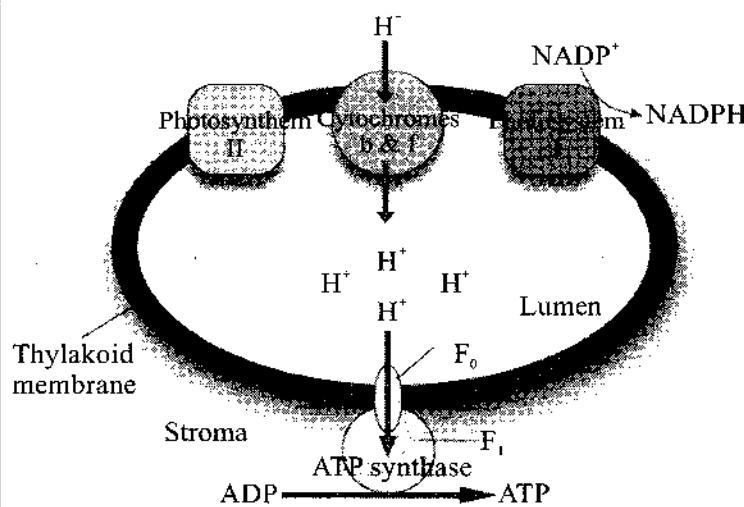
Observe the given diagrammatic representation of the Hatch and Slack pathway and find out labelled parts and also choose true & false statements.

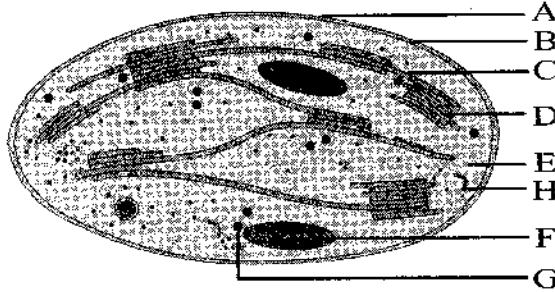
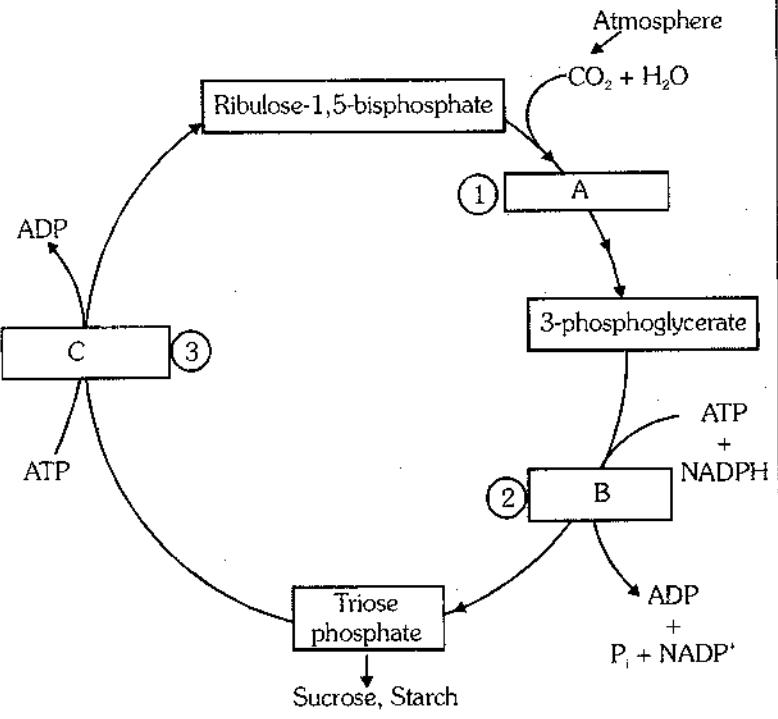
A = Fixation
B = Decarboxylation
C = Regeneration


- (i) In the diagram site of primary fixation lacks RuBisCO enzyme. True
- (ii) In mesophyll cell the transporting C_4 acid may be malic acid or aspartic acid True
- (iii) The bundle sheath cells are rich in an enzyme RuBisCO but lack PEPcase. True

True
True
True
DIAGRAM BASED QUESTIONS
ANSWERS
1.

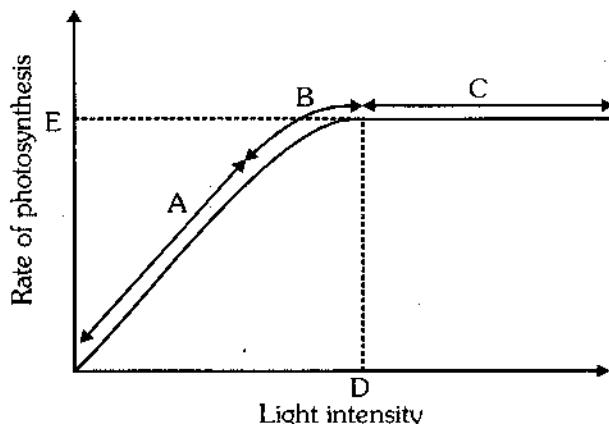
Observe the given figure of ATP synthesis through chemiosmosis and arrange the following events in correct sequence.



	<ul style="list-style-type: none"> (a) Movement of e^- through H carrier (b) Shifting of protons from stroma to Lumen (c) Facilitated diffusion of protons across the membrane (d) Conformational change in the F_1 particle of the ATPase (e) Formation of ATP molecule 	(a) \rightarrow (b) \rightarrow (c) \rightarrow (d) \rightarrow (e)						
2.	<p>Observe the given figure that represents the section of chloroplast and identify the labelled parts according to their function.</p>  <ul style="list-style-type: none"> (i) More permeable membrane (ii) Less permeable membrane (iii) Site containing only P.S. I (iv) Site containing both P.S. I & P.S. II (v) Site of dark reaction (vi) Stored carbohydrate (vii) Stored fat (viii) Factory of protein 							
3.	<p>Observe the given figure of Calvin cycle and find the name of steps and number of ATP and NADPH utilised in them for one molecule of CO_2.</p> 	<p>Steps</p> <p>ATP and NADPH</p> <table> <tr> <td>A = Carboxylation</td> <td>Nil</td> </tr> <tr> <td>B = Reduction</td> <td>2ATP and 2NADPH</td> </tr> <tr> <td>C = Regeneration</td> <td>1ATP</td> </tr> </table>	A = Carboxylation	Nil	B = Reduction	2ATP and 2NADPH	C = Regeneration	1ATP
A = Carboxylation	Nil							
B = Reduction	2ATP and 2NADPH							
C = Regeneration	1ATP							

4.

Observe the given graph carefully and choose the correct statements for labelled points. (A to E)


Points :-

- (A)- There is a linear relationship between incident light and CO_2 fixation rates.
- (B)- It is a transition point where limiting factor changes.
- (C)- At this region light intensity is not showing detrimental effect on rate of photosynthesis.
- (D)- It shows light saturation point sunlight except for plants in shade or in dense forests.
- (E)- This point show maximum rate of photosynthesis at optimum presence of various parameters

All statements are correct

MATCH THE COLUMN
ANSWERS
1.

Match the column I with column II :-

Column-I
Column-II
(Intensity of light)
(Alignment of chloroplast)

(a) High

(i) Along the walls of mesophyll cells

(b) Low

(ii) Perpendicular to light

(c) Moderate

(iii) Dispersed throughout the cytoplasm

a-i, b-ii, c-iii

2.

Match the column I with column II :-

Column-I
Column-II
(Pigment)
(Colour)

(a) Chlorophyll a

(i) Yellow to yellow orange

(b) Chlorophyll b

(ii) Bright or blue green

(c) Xanthophylls

(iii) Yellow green

(d) Carotenoids

(iv) Yellow

a-ii, b-iii, c-iv, d-i

3. Comparison of C_3 and C_4 plants :-

Characteristics	C_3 Plants	C_4 Plants	Choose from
Cell type in which the Calvin cycle takes place	Mesophyll	Bundle sheath	Mesophyll/Bundle sheath/both
Cell type in which the initial carboxylation reaction occurs	Mesophyll	Mesophyll	Mesophyll/Bundle sheath /both
How many cell types does the leaf have that fix CO_2 ?	One	Two	One: Mesophyll Two: Bundle sheath and mesophyll. Three: Bundle sheath, palisade, spongy mesophyll
Which is the primary CO_2 acceptor?	RuBP	PEP	RuBP/PEP/PGA
Number of carbons in the primary CO_2 acceptor	5	3	5 / 4 / 3
Which is the primary CO_2 fixation product ?	PGA	OAA	PGA/OAA/RuBP/PEP
No. of carbons in the primary CO_2 fixation product	3	4	3 / 4 / 5
Does the plant have RuBisCO?	Yes	Yes	Yes/No/Not always
Does the plant have PEP Case?	Yes	Yes	Yes/No/Not always
Which cells in the plant have Rubisco?	Mesophyll	Bundle sheath	Mesophyll/Bundle sheath/none
CO_2 fixation rate under high light conditions	Medium	High	Low/ high/ medium
Whether photorespiration is present at low light intensities ?	Negligible	Negligible	High/negligible/sometimes
Whether photorespiration is present at high light intensities ?	High	Negligible	High/negligible/sometimes
Whether photorespiration would be present at low CO_2 concentrations ?	High	Negligible	High/negligible/sometimes
Whether photorespiration would be present at high CO_2 concentrations ?	Negligible	Negligible	High/negligible/sometimes
Temperature optimum	20-25°C	30-40°C	30-40 C/20-25C/above 40 C
Examples	Wheat Rice	Maize Sugarcane Sorghum	

4. RESPIRATION IN PLANTS

QUESTIONS		ANSWERS
1.	Name the organism(s) that can prepare their own food by photosynthesis	All green plants, cyanobacteria and some other eubacteria.
2.	Name the site(s) where breakdown of complex molecules takes place to yield energy	Cytoplasm & mitochondria
3.	The breakdown of the C-C bonds of complex compounds through oxidation within the cells, leading to release of considerable amount of energy is called.	Respiration
4.	Name the structures/organs in plants that are used for gaseous exchange	Stomata & lenticels
5.	Write the reaction for complex combustion of glucose molecule	$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + \text{Energy}$
6.	All living organisms retain the enzymatic machinery to partially oxidise glucose without the help of oxygen. This breakdown of glucose to pyruvic acid is called.	Glycolysis
7.	Name the scientists who gave the scheme of glycolysis	Gustav Embden Otto Meyerhoff & J. Parnas
8.	Name the site of glycolysis in the cell	Cytoplasm
9.	How many ATP are directly synthesised in glycolysis from one glucose.	4ATP
10.	Write the names of three major ways in which different cells handle pyruvic acid	Lactic acid fermentation Alcoholic fermentation Aerobic respiration
11.	Write the enzymes which catalyse the conversion of pyruvic acid to CO_2 and ethanol	Pyruvic acid decarboxylase Alcohol dehydrogenase
12.	How much amount of energy is released in lactic acid and alcoholic fermentation ?	Less than 7% of total energy in glucose.
13.	Write the enzyme & its coenzymes which catalyse the following reaction :- Pyruvic acid + NAD^+ \longrightarrow AcetylCoA + CO_2 + $NADH$	Pyruvate dehydrogenase, NAD^+ , CoA, Mg^{2+} , TPP (Thiamine pyrophosphate), LA (Lipoic acid)
14.	Name the process by which ATP is formed in electron transport system (ETS) in mitochondria.	Oxidative phosphorylation
15.	How many ATP are gained during aerobic respiration using one glucose.	36 or 38 ATP
16.	The ratio of the volume of CO_2 evolved to the volume of O_2 consumed in respiration is called.	Respiratory quotient (RQ) or Respiratory ratio

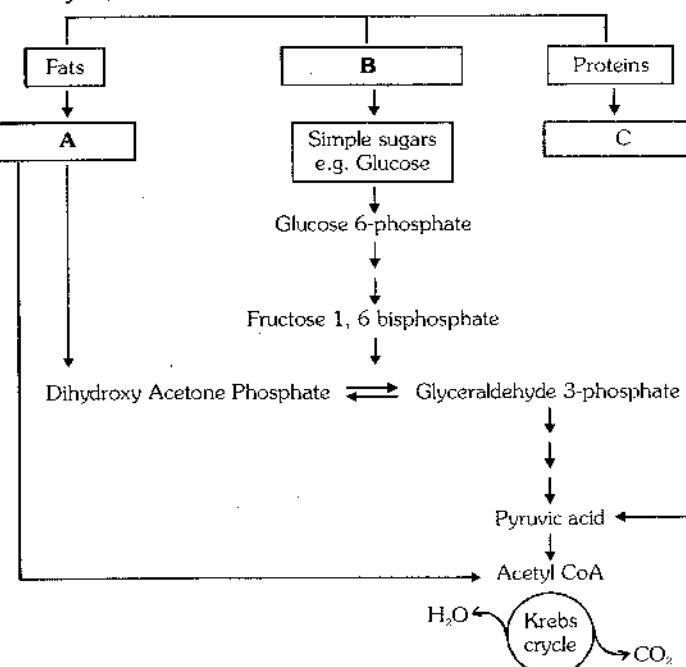
17.	Find the value of RQ when fats (e.g. Tripalmitin) are used in respiration.	0.7
18.	Find the value of RQ when respectively carbohydrates and proteins are used in respiration.	1.0 and 0.9
	FILL IN THE BLANKS	ANSWERS
1.	Usually <u>(A)</u> are oxidised to release energy but <u>(B)</u> and even <u>(C)</u> can be used as respiratory substances in some plants.	A = carbohydrate B = proteins, fats C = organic acids
2.	During oxidation energy released in a series of slow stepwise reactions controlled by <u>(A)</u> and is trapped as <u>(B)</u> in the form of <u>(C)</u> .	A = enzymes B = chemical energy C = ATP
3.	The first cells on this planet lived in atmosphere that lacked <u>(A)</u> .	A = oxygen
4.	Fermentation takes place under <u>(A)</u> conditions in many <u>(B)</u> and unicellular <u>(C)</u> .	A = anaerobic B = prokaryotes C = eukaryotes
5.	Yeast poison themselves to death when the concentration of alcohol reaches about _____.	13%
6.	In mitochondrial matrix pyruvate undergoes _____.	Oxidative decarboxylation
7.	TCA cycle starts with the condensation of acetyl group with <u>(A)</u> and <u>(B)</u> to yield citric acid.	A = oxaloacetic acid B = water
8.	The metabolic pathway present in the inner mitochondrial membrane through which the electron passes from one carrier to another is called _____.	electron transport system (ETS)
9.	Oxidation of one molecule of NADH gives rise to <u>(A)</u> molecules of ATP, while that of one molecule of FADH_2 produces <u>(B)</u> molecules of ATP.	A = three B = two
10.	If fatty acids were to be respiration they would first be degraded to <u>(A)</u> and enter the pathway. Glycerol would enter the pathway after being converted to <u>(B)</u> .	A = acetyl Co-A B = PGAL
11.	Respiratory pathway is involved in both anabolism and catabolism it would hence be better to consider the respiratory pathway as an _____.	amphibolic pathway
	TRUE & FALSE	ANSWERS
1.	Energy released by oxidation in respiration is not used directly but is used to synthesise ATP.	True
2.	ATP acts as the energy currency of the cell because it is broken down whenever (and wherever) energy needs to be utilised.	True
3.	Carbon skeleton produced during respiration. (Eg. α -ketoglutarate, OAA etc. intermediates) are used as precursor for biosynthesis of other molecules in the cell.	True

4.	Plants do not require O_2 for respiration and they never give out CO_2 .	False
5.	Krebs cycle which is also called aerobic respiration requires O_2 supply.	True
6.	In mitochondrial matrix complete oxidation of pyruvate takes place in which all the hydrogen atoms are removed, leaving three molecules of CO_2 .	True
7.	At inner membrane of mitochondria, passing on of the electrons removed as part of the hydrogen atoms to molecular O_2 with simultaneous synthesis of ATP occurs.	True
8.	Oxygen acts as the final hydrogen acceptor in electron transport chain of mitochondria.	True
9.	In respiration, energy of oxidation reduction is utilised for the production of proton gradient required for phosphorylation.	True
10.	Cytochrome C (small protein) is attached to outer surface of the inner mitochondrial membrane.	True
11.	Cytochrome C oxidase complex contains cyto-a & a_3 and two copper centres.	True
12.	When the electrons pass from one carrier to another via complex-I to IV in the electron transport chain, they are coupled to ATP synthase (complex-V) for the production of ATP from ADP and inorganic phosphate.	True
13.	Fermentation accounts for only a partial breakdown of glucose whereas in aerobic respiration it is completely degraded to CO_2 and H_2O .	True
14.	NADH is oxidised to NAD^+ rather slowly in fermentation, however the reaction is very vigorous in case of aerobic respiration.	True

DIAGRAM BASED QUESTIONS

ANSWERS

1. Identify A, B and C :-

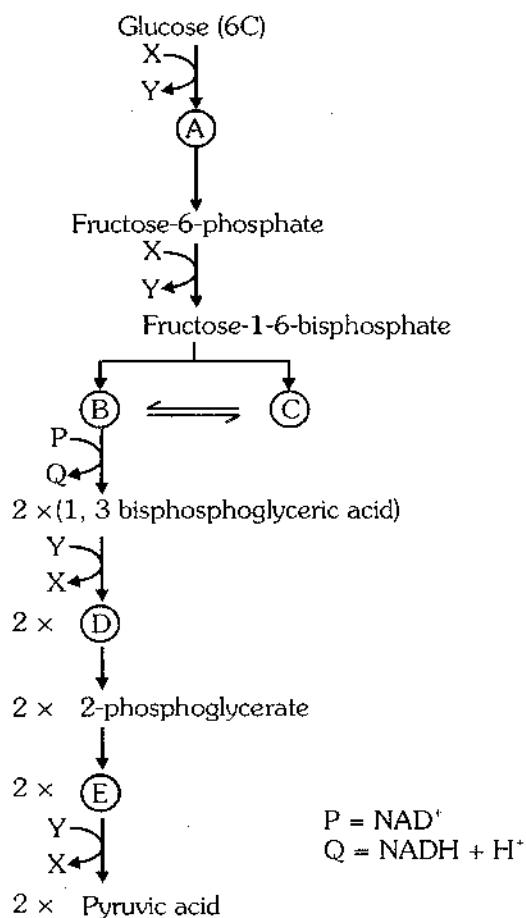


A = Fatty acid and glycerol.

B = Carbohydrate

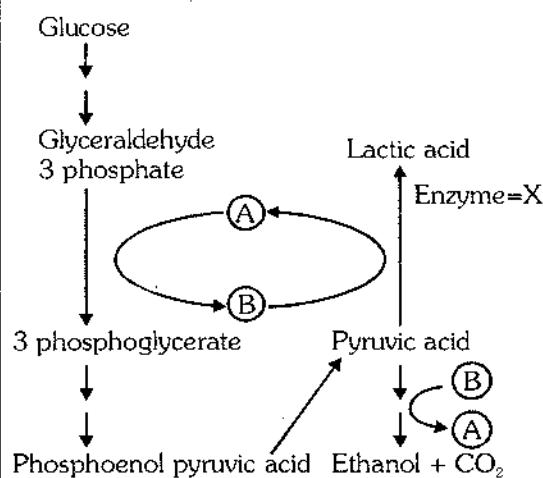
C = Amino acids

2. In the given figure observe the steps of glycolysis and find out labelled parts :-



X = ATP Y = ADP
 A = Glucose-6-phosphate
 B = Glyceraldehyde-3-phosphate
 C = Dihydroxyacetone phosphate
 D = 3-phosphoglyceric acid
 E = Phosphoenolpyruvate

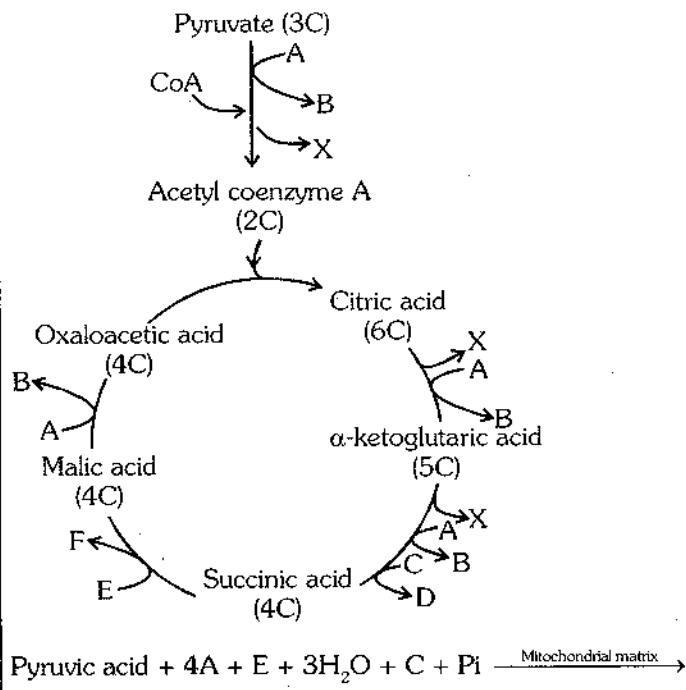
3. By observing following anaerobic respiratory pathway find the labelled parts :-



A = NAD^+
 B = $NADH + H^+$

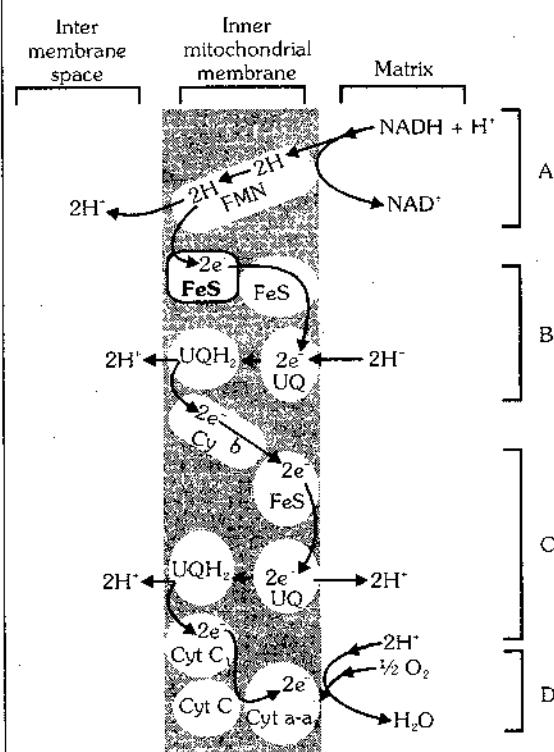
X = Lactate dehydrogenase

4. Find the labelled parts in given cycle, that are summarized in following equation.



$$\begin{array}{ll}
 X = \text{CO}_2, & A = \text{NAD}^+, \\
 B = \text{NADH} + \text{H}^+, & C = \text{GDP}, \\
 D = \text{GTP}, & E = \text{FAD}, \\
 F = \text{FADH}_2 &
 \end{array}$$

5. Identify the A, B, C and D :-



Electron Transport System (ETS)

A = Oxidation of NADH by NADH dehydrogenase (complex-I)

B = Transfer of electrons to ubiquinone via complex-I or complex-II (FADH₂)

C = Transfer of electrons to cytochrome C via cytochrome bc₁ complex (complex-III)

D = Oxidation of cytochrome C by cytochrome C oxidase (complex-IV)

5. PLANT GROWTH AND DEVELOPMENT

QUESTIONS	ANSWERS
1. An irreversible permanent increase in size of an organ or its parts or even of an individual cell is called	Growth
2. Name the cells which have the capacity to divide & self-perpetuate.	Meristematic cell
3. The form of growth where in new cells are always being added to the plant body by the activity of the meristem is called.	Open form of growth
4. Name the meristems which appear later in life of dicotyledonous and gymnosperm plants and causes increase in the girth of the organ in which they are active.	Lateral meristems (Vascular cambium and cork cambium)
5. Write the variety of parameters by which growth can be measured.	Fresh weight, dry weight, length, area, volume, cell number etc.
6. Growth of a pollen tube is measured in terms of its	length
7. The period of growth is generally divided into three phases namely	meristematic, elongation and maturation phase
8. Which phase of growth is represented by root apex & shoot apex?	Meristematic
9. Write the characteristics of cells which are proximal to the meristematic zone.	Increased vacuolation Cell enlargement New cell wall deposition
10. Cells of which phase attain maximum size in terms of wall thickening and protoplasmic modification?	Phase of maturation
11. The increased growth per unit time is termed as	growth rate
12. Relative growth rate is the measure of the ability of the plant to produce new plant material so it is also referred as	efficiency index
13. All changes that an organism goes through during its life cycle from germination of the seed to senescence is called	development
14. Plants follow different pathways in response to environment or phases of life to form different kinds of structures this ability is called	plasticity
15. Sum of growth and differentiation is considered as	development
16. Write the intrinsic and extrinsic growth factors.	Intrinsic = Genetic (intracellular) PGR (intercellular) Extrinsic = light, temperature, water, oxygen and nutrition
17. Name the plant hormones which are involved in growth promoting activities such as cell division, cell enlargement, pattern formation, tropic growth, flowering, fruiting and seed formation.	Auxin, Gibberellin, Cytokinin
18. Plant hormones, which responses to wounds and stresses of biotic & abiotic origin & are also involved in dormancy & abscission, are—	ethylene and abscisic acid
98	

19.	Name the hormone which influence the tip of coleoptile and bend it towards light	Auxin
20.	Inhibitor B, abscission II and dormin are related to which hormone?	Abscisic acid (ABA)
21.	Name the volatile substance which was confirmed by Cousins from ripened oranges.	Ethylene
22.	Miller, F. Skoog and his co-workers are concered to discovery of	Kinetin (Cytokinin)
23.	Name the hormone which is used extensively in agricultural and horticultural practices and help to initiate rooting in stem cutting during plant propagation.	Auxin
24.	In higher plants, the growing apical bud inhibits the growth of the lateral (axillary) buds, this phenomenon is called	apical dominance
25.	Write the process that results in the growth of lateral buds and widely applied in tea plantations and hedge making.	Decapitation
26.	Write the hormone that induce parthenocarpy and also controls xylem differentiation	Auxin
27.	Write the hormone which increase the length of grapes, stalks improves the shape of apple and speed up the malting process in brewing industry.	Gibberellin
28.	Hormone which helps to produce new leaves, chloroplasts in leaves, lateral shoot growth and adventitious shoot formation.	Cytokinin
29.	A simple gaseous PGR synthesised by senescence tissue and ripening fruits.	Ethylene
30.	Hormone which enhances the respiration rate during ripening of the fruits (respiratory climactic)	Ethylene
31.	Name the hormone which promotes root growth and root hair formation.	Ethylene
32.	The most widely used compound as source of ethylene is	Ethepron
33.	Hormone that promotes female flowers in cucumbers and increasing the yield.	Ethylene
34.	Name the hormone which regulate abscission and dormancy.	Abscisic acid
35.	Hormone that inhibits the plant metabolism and seed germination.	Abscisic acid
36.	Flowering response of plants to periods of day/night is termed as	Photoperiodism
37.	If flowering is either quantitatively or qualitatively dependent on exposure to low temperature, this phenomenon is termed as	Vernalisation
FILL IN THE BLANKS		ANSWERS
1.	__(A)___ is regarded as one of the most fundamental and conspicuous characteristics of a living being.	A = Growth

2.	Growth at a cellular level is principally a consequence of increase in the amount of <u>(A)</u>	A = protoplasm
3.	Single maize root apical meristem can give rise to more than <u>A</u> new cells per hour whereas cells in a watermelon may increase in size by upto <u>B</u> times	A = 17,500 B = 3,50,000
4.	During differentiation cells undergo few to major structural changes both in their <u>A</u> and <u>B</u>	A = cell wall B = protoplasm
5.	In a plant, cell/tissues arising out of the same meristem have different structure at maturity it is known as <u>A</u>	A = open differentiation
6.	Development in plants is under the control of <u>A</u> and <u>B</u> factors	A = intrinsic B = extrinsic
7.	Auxin was isolated by <u>A</u> from tips of coleoptiles of oat seedlings	A = F.W. Went
8.	The bakane (foolish seedling), a disease of rice seedlings was caused by a fungal pathogen _____	Gibberella fujikuroi
9.	Cytokinins help overcome the <u>A</u> . They promote <u>B</u> which helps in the delay of leaf senescence.	A = apical-dominance B = nutrient mobilisation
10.	Influence of ethylene on plant include <u>A</u> of seedlings, <u>B</u> and <u>C</u> in dicot seedlings.	A = horizontal growth B = swelling of the axis C = apical hook formation
11.	Ethylene promotes <u>A</u> and <u>B</u> of plant organs especially of leaves and flowers.	A = senescence B = abscission
12.	<u>A</u> promotes rapid internode/petiole elongation in deep water rice plants.	A = Ethylene
13.	<u>A</u> stimulates the closure of stomata in the epidermis and increase the tolerance of plants to various kinds of stresses.	A = ABA
14.	Abscisic acid acts as an antagonist to _____	gibberelic acid
15.	The site of perception of light/dark duration are the _____	leaves
16.	Hormonal substance migrates from leaves to shoot apices for inducing flowering only when the plants are exposed to the necessary _____	inductive photo period
TRUE AND FALSE		ANSWERS
1.	All cells of a plant are descendants of the zygote.	True
2.	The leaves, flowers and fruits of the same tree not only have limited dimensions but also appear and fall periodically and some time repeatedly.	True
3.	Development of a mature plant from a zygote (Fertilized egg) follow a precise and highly ordered succession of events.	True
4.	Plants retain the capacity for unlimited growth throughout their life.	True

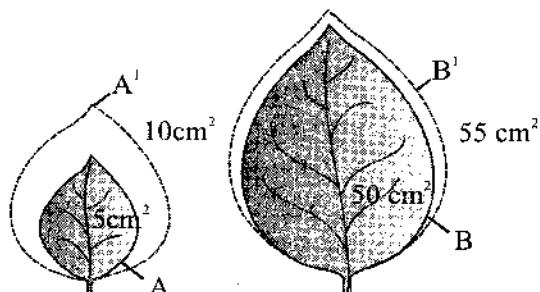
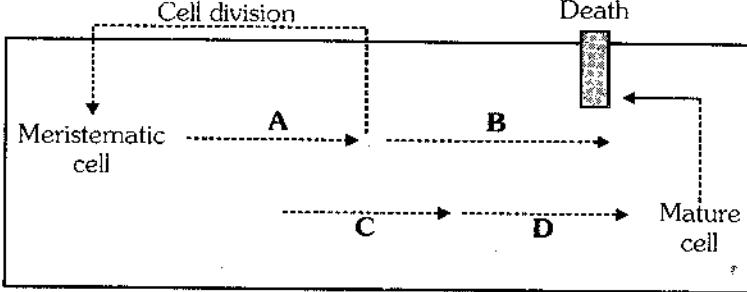
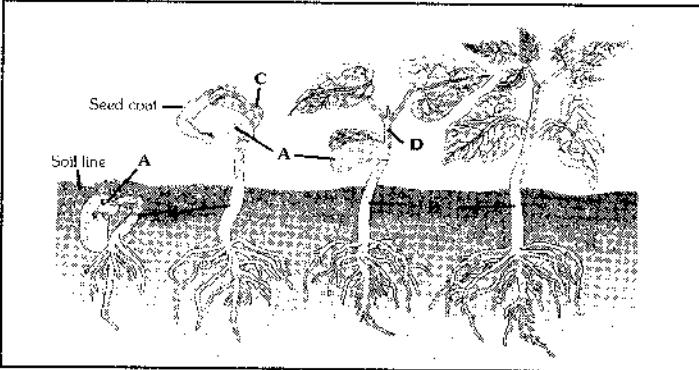
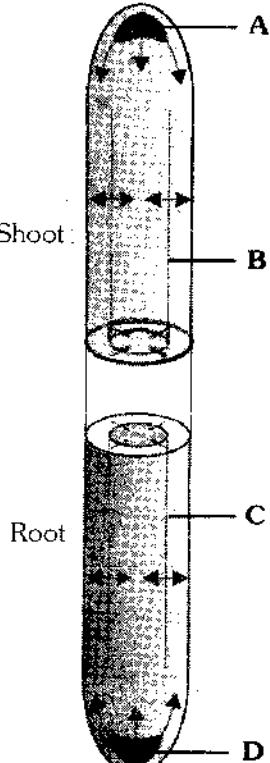
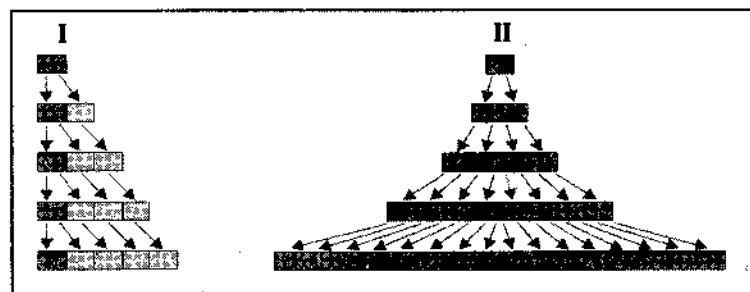
5.	<p>Choose the correct or incorrect statement regarding given figure.</p>  <p>(a) Figure (A) shows more relative growth rate as compare to figure (B).</p> <p>(b) Figure (A) and figure (B) shows the similar absolute growth rate.</p>	True
6.	Water provides the medium for enzymatic activities needed for growth while oxygen helps in releasing metabolic energy essential for growth activities.	True
7.	Nutrients are required by plants for the synthesis of protoplasm and act as source of energy.	True
8.	Auxin was first isolated from human urine.	True
9.	Spraying juvenile conifers with GA hastens the maturity period thus leading to early seed production.	True
10.	Kinetin occur naturally in plants.	False
11.	Natural cytokinins are synthesised in regions where rapid cell division occurs.	True
12.	Ethylene is used to initiate flowering and for synchronising fruit set in pineapples.	True
13.	Ethepron hastens fruit ripening in tomatoes and apples and accelerates abscission in flowers and fruits.	True
14.	ABA plays an important role in seed development, maturation and dormancy.	True
15.	Events like vernalisation, flowering, dormancy, seed germination and plant movements are controlled only by extrinsic factors.	False
16.	In certain plants relative duration of light and dark period plays an important role in flowering.	True
17.	Vernalisation prevents precocious reproductive development late in the growing season.	True
18.	Spring variety is normally planted in winter and harvested in autumn.	False
19.	Biennials are monocarpic plants that normally flower and die in the second season.	True
20.	Effect of vernalisation can not be seen in sugarbeet, cabbages and carrots.	False
21.	Winter varieties of annual plants are planted in autumn, they germinate, and over winter come out as small seedlings, resume growth in spring and are harvested around mid - summer.	True

DIAGRAM BASED QUESTIONS		ANSWERS
1.	<p>Given figure shows the sequence of the development process in a plant cell, identify labelled parts A, B, C and D.</p> 	A = Plasmatic growth B = Differentiation C = Expansion D = Maturation
2.	<p>Find the labelled parts in given figure which shows germination and seedling development in bean.</p> 	A = Cotyledon B = Hypocotyl C = Epicotyl hook D = Epicotyl
3.	<p>Name the labelled meristems in given diagram.</p> 	A = shoot apical meristem B and C = vascular cambium of shoot and root respectively D = root apical meristem



4.

Identify the following diagrammatic representation of types of growth and their mathematical expressions.

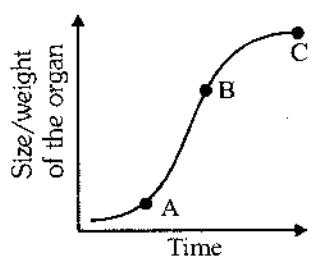


I = Arithmetic $L_t = L_0 + rt$

II = Geometric $W_t = W_0 e^{rt}$

5.

Identify the labelled parts A, B and C in given figure.



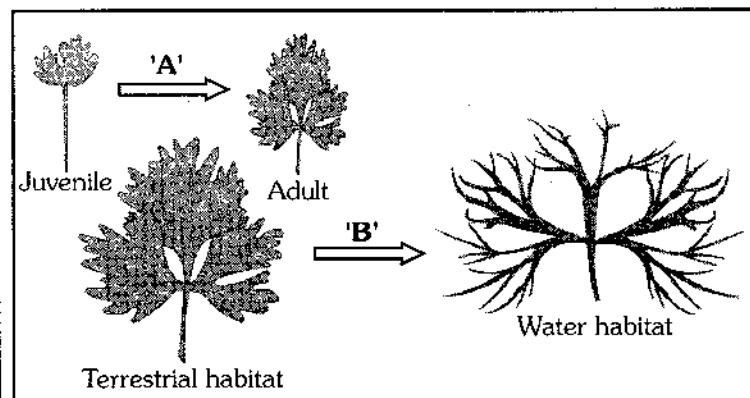
A=Lag phase

B=Log phase or exponential phase

C=Stationary phase

6.

Identify the phenomena A and B :-

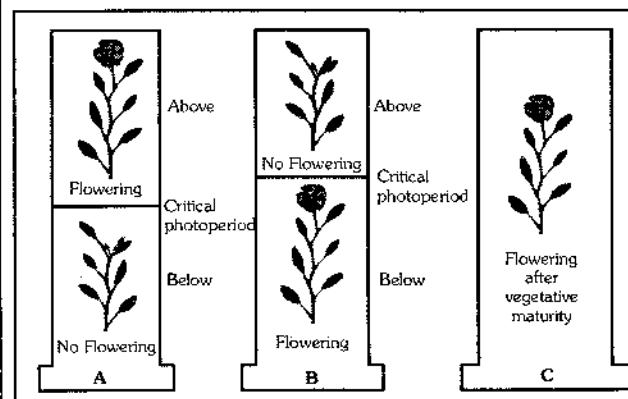


A=Heterophily due to phases of life.

B=Environmental heterophily.

7.

In the given figure identify the group of plant.



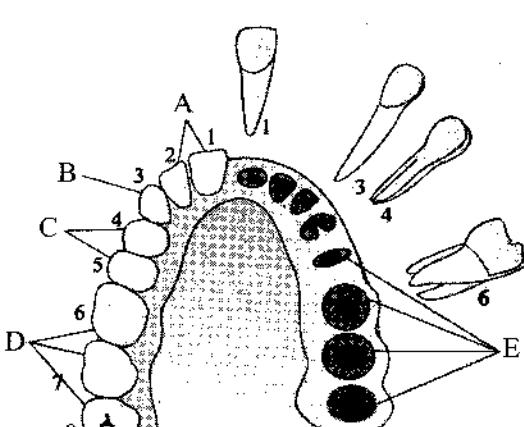
A = Long day plant

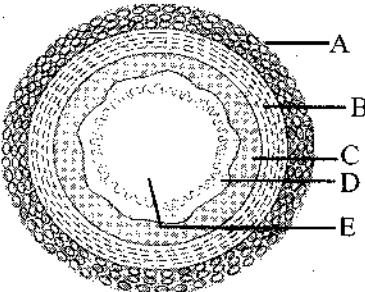
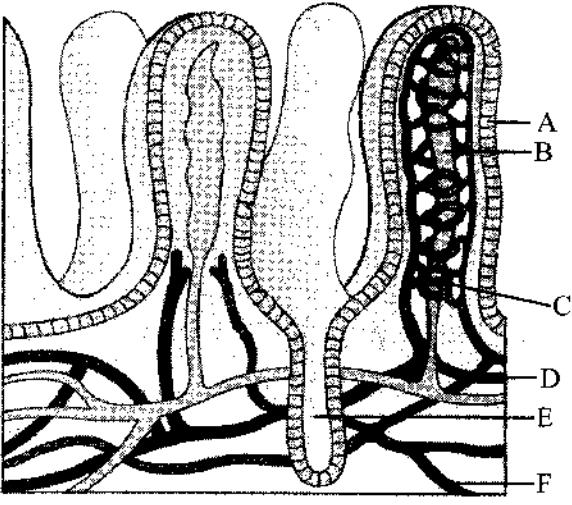
B = Short day plant

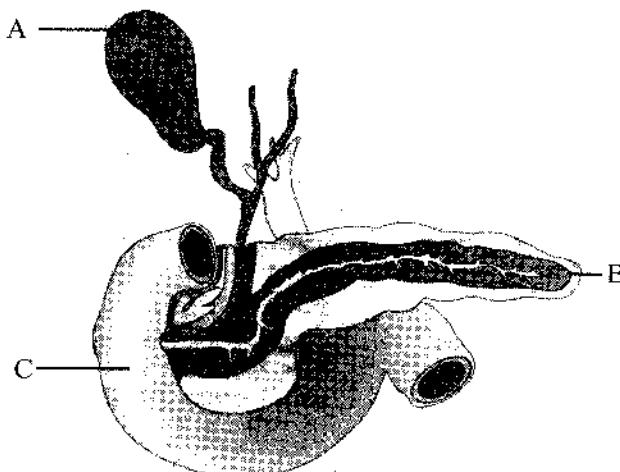
C = Day neutral plant

MATCH THE COLUMNS			ANSWERS																		
1. Match these molecules to their chemical composition :-			A = i, B = ii, C = iii, D = iv, E = v																		
<table border="1"> <thead> <tr> <th></th> <th>Column-I</th> <th>Column-II</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Auxin (IAA)</td> <td>i indole compounds</td> </tr> <tr> <td>B</td> <td>Cytokinins (kinetin)</td> <td>ii adenine derivatives</td> </tr> <tr> <td>C</td> <td>Abscisic acid</td> <td>iii carotenoid derivatives</td> </tr> <tr> <td>D</td> <td>Gibberellic acid</td> <td>iv terpene derivatives</td> </tr> <tr> <td>E</td> <td>Ethylene</td> <td>v C_2H_4</td> </tr> </tbody> </table>				Column-I	Column-II	A	Auxin (IAA)	i indole compounds	B	Cytokinins (kinetin)	ii adenine derivatives	C	Abscisic acid	iii carotenoid derivatives	D	Gibberellic acid	iv terpene derivatives	E	Ethylene	v C_2H_4	
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2. Match the column-I and Column-II :-			1 = a, b 2 = c, d																		
<table border="1"> <thead> <tr> <th></th> <th>Column-I</th> <th>Column-II</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Natural auxin</td> <td>a Indole 3-acetic acid (IAA)</td> </tr> <tr> <td>2</td> <td>Synthetic auxin</td> <td>b Indole butyric acid (IBA)</td> </tr> <tr> <td></td> <td></td> <td>c Naphthalene acetic acid (NAA)</td> </tr> <tr> <td></td> <td></td> <td>d 2,4-dichlorophenoxyacetic acid (2,4D)</td> </tr> </tbody> </table>				Column-I	Column-II	1	Natural auxin	a Indole 3-acetic acid (IAA)	2	Synthetic auxin	b Indole butyric acid (IBA)			c Naphthalene acetic acid (NAA)			d 2,4-dichlorophenoxyacetic acid (2,4D)				
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DIGESTION AND ABSORPTION

Q.NO.	QUESTIONS	ANSWERS
1.	The major component of food are _____, _____ and _____	Carbohydrates, fats, proteins
2.	The process of conversion of complex and large food molecules into smaller and simple absorbable form is called _____	Digestion
3.	Teeth which are present in sockets are called _____	thecodont
4.	Teeth which appear twice in life time are called _____	diphyodont
5.	The tongue is a freely movable muscular organ attached to the floor of the oral cavity by the _____	frenulum
6.	The upper surface of the tongue has small projections called _____, some of which bear taste buds.	papillae
7.	Common passage for food and air is called _____	pharynx
8.	A cartilaginous flap called _____ prevents the entry of food into the _____, opening of the wind pipe - during _____.	Epiglottis, glottis, swallowing
9.	The stomach, located in the upper <u>A</u> portion of the abdominal cavity, has three major parts-a <u>B</u> portion into which the oesophagus opens, a <u>C</u> region and a <u>D</u> portion which opens into the first part of small intestine	A-Left, B-Cardiac, C-Fundic, D-Pyloric
10.	Small intestine is distinguishable into three regions, a 'C' shaped <u>A</u> , a long coiled middle portion <u>B</u> and a highly coiled <u>C</u> .	A-Duodenum, B-Jejunum, C-Ileum
11.	 Identify A, B, C, D and E in the given diagram of arrangement of teeth	A-Incisor, B-Canine, C-Premolar, D-Molar, E-Socket of jaw
12.	_____ is small blind sac which hosts some symbiotic microorganisms	Caecum
13.	_____ is the smallest part of small intestine	Duodenum

14.	_____ is the outermost layer of alimentary canal and is made up of a thin _____	Serosa , mesothelium
15.	The submucosa of alimentary canal is made up of _____	Loose connective tissue
16.	In duodenum glands are present in _____	Submucosa
17.	The innermost layer lining the lumen of the alimentary canal is the _____	Mucosa
18.	Mucosa layer form irregular folds called _____ in stomach and small finger like folding called _____ in the small intestine	Rugae , villi
19.	Villi are supplied with a network of capillaries and a large lymph vessel called the _____	Lacteal
20.	Label A, B, C, D and E in the given diagrammatic representation of transverse section of gut.	A-Serosa, B-Muscularis, C-Submucosa, D-Mucosa, E-Lumen 
21.	Label A, B, C, D, E and F in the given diagrammatic representation of transverse section of villi.	A-Villi, B-Lacteals, C-Capillaries, D-Arteries, E-Crypts, F-Vein 
22.	Name the cells in the mucosal epithelium that helps in lubrication	Goblet cells
23.	How many pair of salivary glands found in human beings?	Three
24.	Name the three types of salivary glands found in human beings.	Parotid, sublingual, submandibular
25.	Name the largest gland of the body.	Liver
26.	Name the structural and functional unit of the liver.	Hepatic lobule
27.	Bile is stored in _____	Gall bladder

28.	Name the duct arise from gall bladder	Cystic duct
29.	In human beings liver is divided into _____ lobes	Two
30.	Answer the following questions after observing the given diagram	(a) A-gall bladder, (b) B-pancreas (c) C-duodenum
	 <p>(a) helps in concentration of bile juice (b) heterocrine gland (c) smallest part of small intestine</p>	
31.	The bile duct and the pancreatic duct open together into the duodenum as the common _____ which is guarded by a sphincter called the _____	Hepato pancreatic duct, sphincter of Oddi
32.	The exocrine part of pancreas secrets _____ and the endocrine part secretes _____	Pancreatic juice, hormones
33.	What are the two major functions of buccal cavity?	Mastication of food, swallowing of food
34.	_____ in saliva helps in lubrication and adhering the masticated food particles into a _____	Mucus, bolus
35.	The _____ controls the passage of food into the stomach.	Gastro oesophageal sphincter
36.	Name the enzyme found in saliva.	Salivary amylase
37.	Salivary amylase convert _____ into _____	Starch, maltose
38.	The chemical process of digestion begins in _____	Oral cavity
39.	Mixture of food and saliva in oral cavity is called	Bolus
40.	Name the cells found in gastric glands which secrets the proenzyme pepsinogen	Chief/zymogen/peptic cell
41.	Name the factor essential for absorption of vitamin B12	Castle intrinsic factor
42.	Mixture of food and gastric juice in stomach is called _____	chyme
43.	How pepsinogen is converted into pepsin in stomach?	In the presence of concentrated HCl
44.	Name the enzyme which helps in digestion of proteins in stomach.	Pepsin
45.	What is the function of pepsin in stomach?	Convert proteins into proteoses and peptones

46.	Name the inactive enzymes present in pancreatic juice.	Trypsinogen, chymotrypsinogen, procarboxypeptidases, amylases, lipases, nucleases
47.	Name the nondigestive enzyme which helps in activation of trypsinogen	Enterokinase
48.	Enterokinase is secreted by	Intestinal mucosa
49.	Intestinal juice is also called _____	Succus entericus
50.	Complete the following reactions (a) Proteins Peptones Proteoses \xrightarrow{a} Dipeptides (b) Polysaccharides (starch) \xrightarrow{b} Disaccharides (c) Fats \xrightarrow{c} Diglycerides \xrightarrow{c} Monoglycerides (d) Nucleic acids \xrightarrow{d} Nucleotides \xrightarrow{d} Nucleosides	(a) Trypsin, chymotrypsin, carboxypeptidase (b) Pancreatic amylase (c) Pancreatic lipase (d) Nucleases
51.	Name the enzymes found in the following reactions Dipeptides \xrightarrow{A} Amino acids Maltose \xrightarrow{B} Glucose + Glucose Lactose \xrightarrow{C} Glucose + Galactose Sucrose \xrightarrow{D} Glucose + Fructose Nucleotides \xrightarrow{E} Nucleosides \xrightarrow{F} Sugars + Bases Di and Monoglycerides \xrightarrow{G} Fatty acids + Glycerol	(A) Dipeptidase (B) Maltase (C) Lactase (D) Sucrase (E) Nucleotidase, (F) Nucleosidase (G) Intestinal lipase
52.	Maximum absorption of digested food takes place in _____	Jejunum
53.	Name the process by which fructose and some amino acids are absorbed in small intestine	Facilitated transport
54.	Transport of water depends upon the _____	Osmotic gradient
55.	Fatty acids and glycerol are not absorbed into the blood. Why ?	Because these are insoluble in water
56.	Fill in the blanks and complete the following paragraph Fatty acids and glycerol being <u>a</u> , cannot be absorbed into the blood. They are first incorporated into small droplets called <u>b</u> which move into the intestinal <u>c</u> . They are re-formed into very small protein coated fat globules called the <u>d</u> which are transported into the <u>e</u> in the villi. These lymph vessels ultimately release the absorbed substances into the <u>f</u> .	(a) Insoluble (b) Micelles (c) Mucosa (d) Chylomicrons (e) Lymph vessels (lacteals) (f) Blood capillaries
57.	The absorbed substances finally reach the tissues which utilise them for their activities. This process is called _____.	assimilation

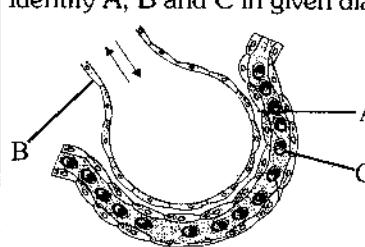
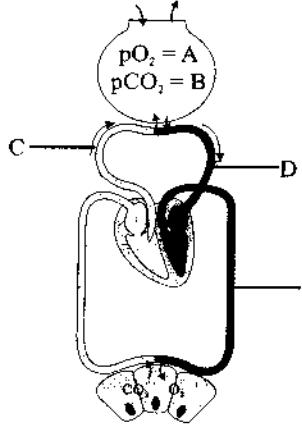
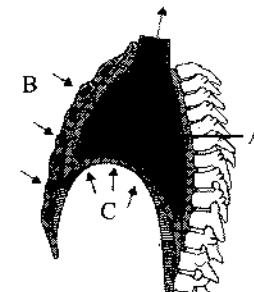


58.	<p>Name the diseases</p> <p>(a) <u>A</u> : The liver is affected, skin and eyes turn yellow due to the deposit of bile pigments.</p> <p>(b) <u>B</u> : It is the ejection of stomach contents through the mouth. This reflex action is controlled by the vomit centre in the medulla. A feeling of nausea precedes vomiting.</p> <p>(c) <u>C</u> : The abnormal frequency of bowel movement and increased liquidity of the faecal discharge is known as diarrhoea. It reduces the absorption of food.</p> <p>(d) In <u>D</u> : the faeces are retained within the rectum as the bowel movements occur irregularly.</p> <p>(e) <u>E</u> : In this condition, the food is not properly digested leading to a feeling of fullness.</p>	<p>(A) Jaundice</p> <p>(B) Vomiting</p> <p>(C) Diarrhoea</p> <p>(D) Constipation</p> <p>(E) Indigestion</p>
59.	Why are villi present in intestine and not in stomach ?	Food is completely digested in intestine but not in stomach
60.	What are the basic layers of the walls of the alimentary canal?	Serosa, muscularis, submucosa, mucosa

BREATHING AND EXCHANGE OF GASES

Q.NO.	QUESTIONS	ANSWERS	
1.	Oxygen is utilised by the organism to <u>(a)</u> breakdown nutrients molecules like <u>(b)</u> and to derive <u>(c)</u> for performing various activities.	(a) Indirectly (b) Glucose (c) Energy	
2.	Gas which is released during catabolic reaction of respiration is <u> </u>	CO ₂	
3.	Process of exchange of O ₂ from the atmosphere with CO ₂ produced by the cells is called	Breathing	
4.	Mechanism of breathing vary among different groups of animals depending mainly on <u> </u> and <u> </u> .	a. Habitats b. Levels of organisation	
5.	Column-I (A) Diffusion over their entire body surface (B) Gills (C) Moist cuticle (D) Tracheal tubes (E) Vascularised bag	Column-II (i) Reptilia, Birds, mammals (ii) Insects (iii) Coelenterates, flat worm (iv) Aquatic arthropods and molluscs (v) Earthworm	A-iii, B-iv, C-v, D-ii, E-i
6.	Common passage for food and air <u> </u>	Pharynx	
7.	Glottis is the opening of <u> </u>	Larynx	
8.	Structure which in sound production is made up of <u> </u>	Cartilages	
9.	During swallowing glottis can be covered by a thick fibrous cartilagenous flap called epiglottis. (True/false)	False	
10.	Origin of right and left primary bronchi occurs at the level of <u> </u>	T ₅	
11.	Each terminal bronchiole gives rise to a number of very thin, irregular walled and vascularised bag like structure called <u> </u>	Alveoli	
12.	Incomplete cartilagenous rings are present upto <u> </u>	Initial Bronchioles	
13.	Conducting part starts with external nostrils and extended upto <u> </u>	Terminal bronchiole	
14.	What is the significance of pleural fluid ?	Provide friction-less movement between pleural membrane	
15.	Given statement is true or false Statement : Actual site for diffusion of O ₂ and CO ₂ between blood and atmospheric air is exchange part.	True	
16.	Breathing involves two stages <u>(a)</u> during which atmospheric air is drawn in and <u>(b)</u> by which the alveolar air is released out.	a. Inspiration b. Expiration	
17.	Movement of air into and out of the lungs is carried out by a creating <u> </u> between the lungs and atmosphere.	Pressure gradient	
18.	Expiration takes place when	Intrapulmonary pressure is higher than the atmospheric pressure	

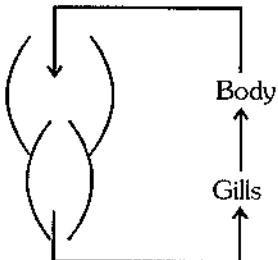
19.	The volume of air involved in breathing movements can be estimated by :	Spirometer
20.	Match column-I and column-II Column-I (a) Tidal volume (b) Expiratory reserve volume (c) Inspiratory capacity (d) Vital capacity (e) Residual volume (f) Functional residual capacity Column-II (i) 1200 ml (ii) 4200 ml (iii) 500 ml (iv) 1100 ml (v) 2300 ml (vi) 3000 ml	a-iii, b-iv, c-vi, d-ii, e-i, f-v
21.	Simple diffusion mainly based on :	(a) Pressure/concentration Gradient (b) Solubility of gases (c) Thickness of membrane involved in diffusion
22.	The diffusion membrane is made up of : (A) Thick columnar epithelium of alveoli (B) Endothelium of alveolar capillaries (C) Basement substances in between capillaries and alveoli	Only (B and C)
23.	Least amount of CO_2 is carried out in _____	Dissolved state through plasma
24.	Factors those interfere with the binding of O_2 with haemoglobin are :	(A) Partial pressure of CO_2 (B) H^+ concentration, (C) Temperature
25.	O_2 dissociation curve is :	Sigmoid curve
26.	Factor which is favourable for the formation of oxyhaemoglobin	(A) Lesser H^+ concentration (B) High pO_2 , (C) Low pCO_2
27.	Under normal physiological condition every 100 ml of oxygenated blood can deliver _____ ml of O_2	5
28.	Dissociation of CO_2 from carbamino-haemoglobin takes place when :	pCO_2 is low ; pO_2 is high
29.	At the tissue site where partial pressure of CO_2 is <u>a</u> due to <u>b</u> , CO_2 diffuse into blood and form <u>c</u> and <u>d</u> .	a - High b - Catabolism c - HCO_3^- d - H^+
30.	Every 100 mL of deoxygenated blood transport how much amount of CO_2 ?	4 ml
31.	Human beings have ability to maintain and moderate the respiratory rhythm by the help of :	Neural system
32.	Respiratory rhythm centre is present in _____ region of brain	Medulla oblongata
33.	Centre which can moderate the function of respiratory rhythm centre is located in :	Pons
34.	Chemosensitive area sends signals to make necessary adjustments for respiration to :	Respiratory rhythm centre

35.	Aortic arch and carotid artery receptors can recognize changes in :	CO_2, H^+
36.	Role of oxygen in the regulation of respiratory rhythm is quite insignificant. (True/false)	True
37.	Match column-I and II	
	Column-I	Column-II
	(A) Asthma (B) Emphysema (C) Occupational respiratory Disorders	(i) Alveolar wall damaged (ii) Inflammation leading to fibrosis (iii) Wheezing due to inflammation of bronchi and bronchioles
38.	Long exposure to dust can give rise to :	Inflammation leading to proliferation of fibrous tissues in lungs.
39.	Identify A, B and C in given diagram :	(A) Basement substance (B) Alveolar wall (C) RBC
		
40.	Identify A, B, C, D, E in given diagram :	(A) 104 (B) 40 (C) Pulmonary artery (D) Pulmonary vein (E) Systemic arteries
		
41.	Identify A, B, and C in the given diagram :	(A) volume of thorax decreased (B) Ribs and sternum return to original position (C) Diaphragm relaxed
		

BODY FLUIDS AND CIRCULATION

Q.NO.	QUESTIONS	ANSWERS
1.	Open type circulatory system is present in which phylum ?	Mollusca, Arthropoda
2.	Close type circulatory system is present in which phylum ?	Annelida, Chordata
3.	Name the system in which the blood pumped by the heart is circulated through a close network ?	Closed type of circulation
4.	Name the system in which the blood pumped by the heart is circulated through large vessels into sinuses ?	Open type of circulation
5.	In which animal the heart pumps out only deoxygenated blood ?	Fishes
6.	Another name of coronary artery disease is _____.	Atherosclerosis
7.	In which disease arteries lumen become narrower due to the deposition of calcium fat and cholesterol ?	Atherosclerosis
8.	In which disease a symptom of acute chest pain appears when no enough oxygen is reaching the heart muscles ?	Angina Pectoris
9.	How a person can determine the heart rate of an individual by the observation of ECG ?	By counting the number of QRS complex
10.	In an individual, where the heart is located ?	Mediastinal space
11.	FILL IN THE BLANKS	ANSWERS
a.	Amphibians and Reptiles have a 3 chambered heart with _____ atria and _____ ventricle.	2, 1
b.	Heart is _____ derived organ and protected by a double walled membranous bag called _____.	Mesodermal, Pericardium
c.	The opening between Right Atrium and Right ventricle is guarded by a valve formed of _____ muscular flaps, the _____ valve.	3, Tricuspid
d.	The wall of ventricle is _____ than atria.	thicker
e.	SAN can generate the maximum number of action potential i.e. _____ min^{-1} . There fore it is called _____.	72, Pacemaker
f.	Atrial systole increases the flow of blood into the ventricles by about _____ percent.	30%
g.	In _____ all the four chambers of the heart are in a relax state.	Joint diastole
h.	The _____ wave represents the depolarisation of the atria.	P
i.	A system of blood vessels is present in our body exclusively for the circulation of blood to and from the cardiac musculature called _____.	Coronary
j.	PNS _____ the rate of heart beat and _____.	Decrease, Cardiac output
12.	TRUE/FALSE BASED QUESTIONS	ANSWERS
a.	SAN generates an action potential which stimulates atrial systole.	T
b.	ECG is an electrical representation of the graphical activity of the heart during a cardiac cycle.	F
c.	The cardiac output of a normal man will be much lesser than an athlete.	T
d.	The wall of right ventricle is much thicker than the left ventricle.	F
e.	In pisces the two separate circulatory pathways are present, hence they have double circulation.	F

f.	The closed circulatory pattern is considered to be more advantageous than open circulatory pattern.	T
g.	Glucose is absorbed by simple diffusion through lymph in lacteals present in the intestinal villi.	F
h.	The SAN can generate the maximum number of action potential i.e. $140-150 \text{ min}^{-1}$ in neonates, and is responsible for initiation and maintenance of the rhythmic contractile activity of the heart.	T
i.	Angina can occur in any age but more common among the neonates and infants.	F
j.	Heart failure is sometimes called congestive heart failure because congestion of the blood vessels is one of the main symptoms of this disease.	F

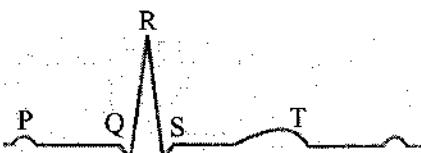
13. FIGURE BASED QUESTIONS -
I. Figure-1


a. In the above given flowchart blood filled in the heart is :-

Deoxygenated

b. This type of blood circulation can be observed in :-

Fishes

II. Figure-2


a. The P wave represent the electrical excitation of the _____.

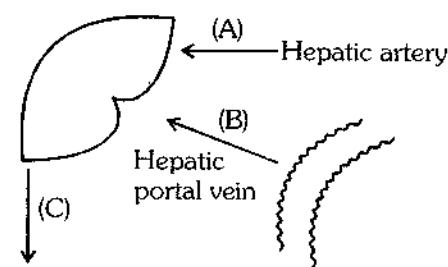
Atrial depolarization

b. The QRS complex represents the _____ of the ventricles.

Depolarization

c. The end of T wave marks the end of _____.

Ventricular systole

III. Figure-3


In which of the above given blood vessels maximum urea is present.

C - Hepatic vein

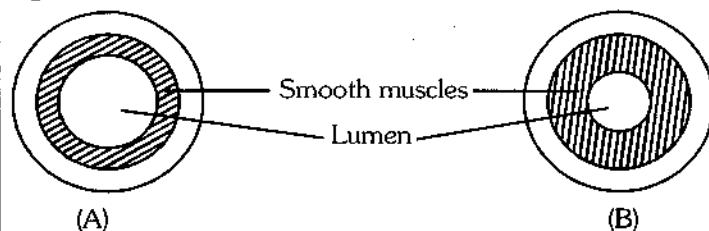
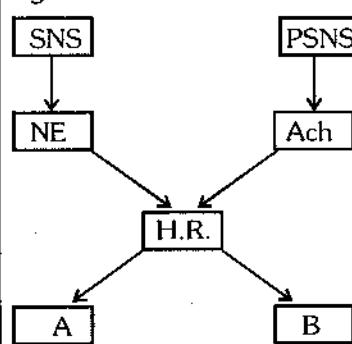
IV.
Figure-4


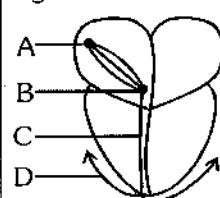
Figure A and B represents the section of which types of blood vessels respectively?

A Vein B Artery

V.
Figure-5


A and B are

Increase and decrease respectively

VI.
Figure-6


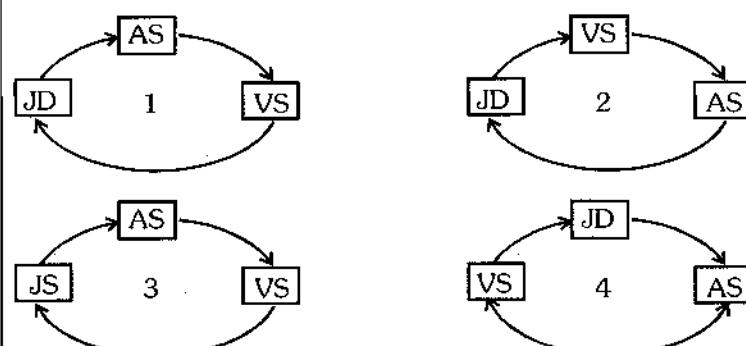
Identify A, B, C, D in the above given figure.

A - SA Node
B - AV Node
C - Bundle of HIS
D - Purkinje fibres

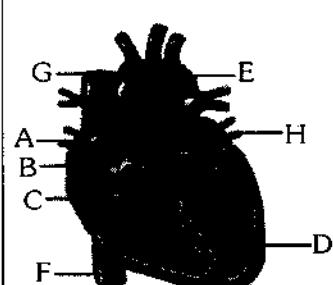
VII.

Identify the wrong representation of cardiac cycle.

2, 3

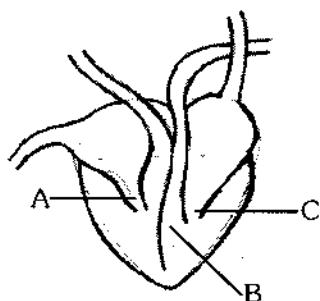

14.

Labelling Based Question -

a.


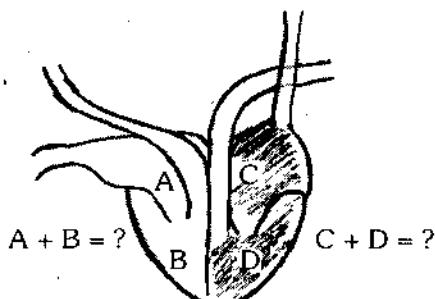
A - SA node
B - AV node
C - Bundle of HIS
D - Purkinje fibres
E - Arch of Aorta
F - IVC
G - SVC
H - Pulmonary vein

b.



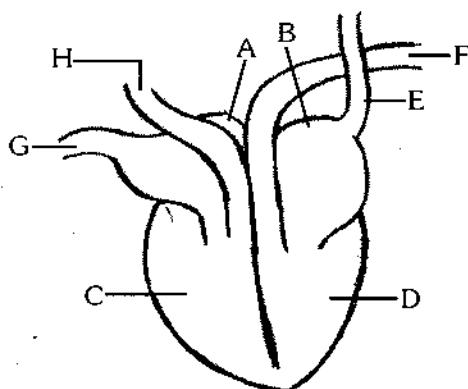
A - Tricuspid valve
 B - Semilunar valve
 C - Bicuspid valve

c.



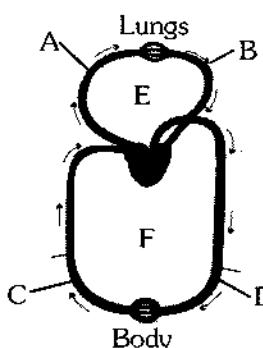
A + B = Pulmonary Heart
 C + D = Systemic Heart

d.



A - Rt. Atrium
 B - Lt. Atrium
 C - Rt. Ventricle
 D - Lt. Ventricle
 E - Pulmonary vein
 F - Systemic aorta
 G - Vena cava
 H - Pulmonary Aorta

e.



A - Pulmonary Aorta
 B - Pulmonary vein
 C - Vena cava
 D - Systemic aorta
 E - Pulmonary circulation
 F - Systemic circulation

15.

MATRIX MATCH TYPE -

a.

	Column I		Column II
A	Sinuses	i	Frog
B	Capillaries	ii	Rohu
C	Venous heart	iii	Annelida
D	Mixed blood	iv	Mollusca

ANSWERS

A-iv, B-iii, C-ii, D-i

b.

A	Atherosclerosis	i	Vital organs effected		
B	Angina pectoris	ii	Heart stops beating		
C	Heart failure	iii	acute chest pain		
D	Heart attack	iv	Calcium and cholesterol deposition		
E	Hypertension	v	Ineffective pumping of blood		
F	Cardiac arrest	vi	Heart muscles damage		

A-iv, B-iii, C-v, D-vi, E-i, F-ii

c.

	1	2	3	4	
(A)	Sympathetic	(i) Ach	(a) HR ↑	(K) Cardiac output ↑	
(B)	Parasympathetic	(ii) NE	(b) HR ↓	(L) Cardiac output ↓	

A - ii - a - K, B - i - b - L

d.

	1	2	
A	Systemic circulation	i	Right Atrium - Right Ventricle
B	Pulmonary circulation	ii	Left Atrium - Left Ventricle
C	Systemic heart	iii	Left Ventricle → Body → Right Atrium
D	Pulmonary heart	iv	Right Ventricle → Lungs → Left Atrium

A-iii, B-iv, C-ii, D-i

e.

	1	2	
A	P wave	i	Ventricular repolarization
B	QRS complex	ii	Atrial depolarization
C	T wave	iii	Ventricular depolarization
		iv	Atrial Repolarization

A-ii, B-iii, C-i

f.

	1	2	
A	Cardiac output	i	0.8 sec
B	Stroke volume	ii	70 mL
C	Heart rate	iii	70-72 min ⁻¹
D	Cardiac cycle	iv	5000 mL

A-iv, B-ii, C-iii, D-i

g.

	1	2	
A	Atrial systole	i	0.3 sec
B	Atrial diastole	ii	0.5 sec
C	Ventricular systole	iii	0.1 sec
D	Ventricular diastole	iv	0.4 sec
E	Joint diastole	v	0.7 sec

A-iii, B-v, C-i, D-ii, E-iv

h.

	1		2
A	Tricuspid valve	i	2 nd heart sound
B	Mitral valve	ii	SA Node
C	Pacemaker	iii	Bicuspid valve
D	LUB	iv	1 st heart sound
E	DUP	v	Right Atriventricular septum

A-v, B-iii, C-ii, D-iv, E-i

i.

	1		2
A	Artery	i	Carry blood towards the body
B	Vein	ii	Carry blood toward the heart
		iii	Valve in the lumen
		iv	Thick walled
		v	Wider lumen
		vi	Red colored
		vii	Superficial location

A-i, iv, vi B-ii, iii, v, vii

j.

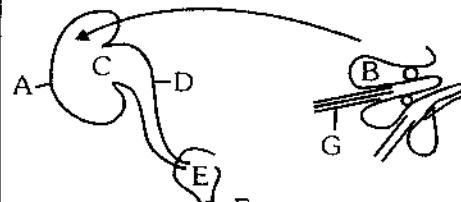
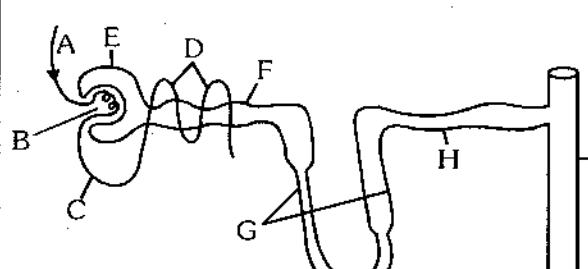
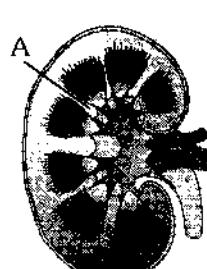
	1		2
A	SA Node	i	Inter ventricular septum
B	AV Node	ii	Rigth atrium upper corner
C	Bundle of His	iii	Ventricular wall
D	Purkinje fibres	iv	Lower left corner of Right Atrium

A-ii, B-iv, C-i, D-iii

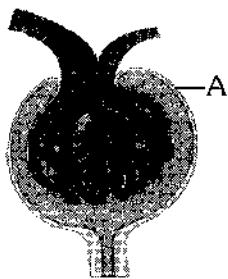
EXCRETORY PRODUCTS AND THEIR ELIMINATION

Q.NO.	QUESTION	ANSWERS
1.	Common forms of nitrogenous waste of organism are	Ammonia, urea, uric acids.
2.	Most toxic nitrogenous waste material is	Ammonia.
3.	Least toxic nitrogenous waste material is	Uric acid.
4.	Removal of ammonia from body is called	Ammonotelism.
5.	Length of kidney in human being is	10-12 cm
6.	Average weight of human kidney in human beings is	120 to 170 gm
7.	The notch on the centre of inner concave surface of kidney is	Hilum
8.	Funnel shaped space in kidney is called	Renal pelvis
9.	Projections of renal pelvis called	Calyces
10.	Outer zone of kidney is known as	Cortex
11.	Inner zone of kidney is known as	Medulla
12.	Name the conical masses of medulla	Medullary pyramids
13.	Number of nephron in each kidney is	1 Million
14.	Name the branch of artery which take away blood from glomerulus	Efferent arterioles
15.	The structure which encloses glomerulus is	Bowman's Capsule
16.	Glomerulus and Bowman's capsule together form	Malpighian body
17.	Hair pin shaped structure in nephron is called	Henle's loop
18.	DCT of nephron opens in	Collecting duct
19.	Loop of Henle is too short and remain very little into medulla. This nephron is _____	Cortical nephron
20.	Loop of Henle come deep into medulla in	Juxta medullary nephron
21.	Projection of cortex into medulla is called	Columns of Bertini
22.	U-shaped vessels running parallel to Henle's loop called	Vasa recta
23.	Vasa recta is absent in	Cortical nephron
24.	Epithelial cells of Bowman's capsule	Podocytes
25.	GFR is regulated by	Juxta glomerular apparatus
26.	Approximate value of GFR	180 litre/day
27.	A special sensitive region formed by cellular modifications in DCT and afferent arteriole at the location of their contact is called	Juxta glomeular apparatus
28.	Reabsorption occurs in	Tubular epithelial cells
29.	PCT is lined by epithelium	Simple cuboidal brush border
30.	How much electrolytes are absorbed by PCT of nephron ?	70 to 80%
31.	Flow of blood in opposite direction in limbs of henle's loop and vasa recta forms	Counter current mechanism
32.	Counter current mechanism is useful for	Maintaining concentration gradient in medullary interstitium

33.	pH of urine is	'6'
34.	On an average how much urea is excreted out per day ?	25-30 gm
35.	Presence of glucose in urine is called	Glycosuria
36.	Presence of ketone bodies in urine is called	Ketonuria
37.	Ketonuria & glycosuria is an indicative of	Diabetes mellitus
38.	How much amount of CO_2 is removed by lungs per day ?	18 litre
39.	Primary function of sweat is	Cooling of the body
40.	Accumulation of urea in blood is called	Uremia
41.	Stones or insoluble mass of crystallised salts formed within the kidney is called	Renal calculi
42.	Inflammation of glomeruli of kidney is called	Glomerulonephritis
FILL IN THE BLANKS		ANSWERS
1.	In kidney failure condition urea can be removed by _____ process.	Hemodialysis
2.	Ammonia is converted into urea in _____ and filtered from blood and excreted out by _____	Liver, Kidney
3.	Kidney is situated between level of last _____ and third _____ vertebra	Thoracic, lumbar
4.	Projection of cortex between medullary pyramids is called _____	Column of bertini
5.	_____ is a tuft of capillaries formed by the afferent arteriole which is a fine branch of _____	Glomerulus, renal artery
6.	Efferent arteriole emerging from glomerulus forms fine capillary network around renal tubule known as _____ capillaries.	Peritubular
7.	_____, _____ and _____ are three processes involved in urine formation.	Glomerular filtration, reabsorption, secretion
8.	Epithelial cells of bowman's capsule called _____ are arranged in an intricate manner	Podocytes Intricate
9.	A fall in GFR can activate the juxta glomerular cells to release _____	Renin
10.	Glucose, amino acids and Na^+ are reabsorbed _____	Actively
11.	Tubular cells secrete _____ and _____	H^+ , K^+
12.	Tubular secretion helps in maintenance of _____ and _____ balance of the body.	Ionic, acid-base
13.	PCT helps in secretion of _____	H^+ , K^+ and NH_3
14.	Descending limb of loop of henle is _____ and ascending limb is _____ to water	Permeable, impermeable
15.	Kidney function is regulated by feedback mechanism involving the _____ and _____	Hypothalamus, juxta glomerulus apparatus
16.	Decrease in blood volume activate _____ which secrete ADH which Prevent _____ and also effect kidney function by it's _____ effects on blood vessels. Causes _____ in blood pressure. Causes _____ in GFR.	Neurohypophysis Diuresis, constrictory Increase Increase

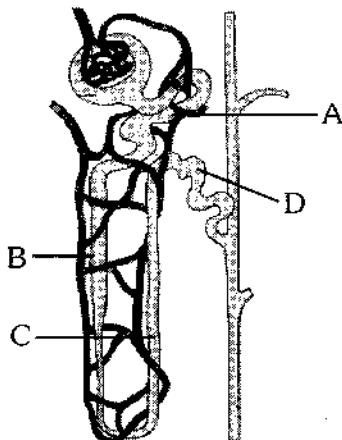
17.	ANF causes _____	Vasodilation																		
18.	Fall in GFR activate JG cells to release renin which converts angiotensinogen into _____. Angiotensinogen-II is a powerful _____. Causes increase in glomerular blood pressure. Causes increase in _____.	Angiotensin-I Vasoconstrictor GFR																		
19.	Angiotensinogen-II also stimulates adrenal cortex to release _____	Aldosterone																		
20.	(i) Signals from CNS started by stretching of the _____ as it gets filled with urine. (ii) Stretch receptors send signals to _____. (iii) CNS gives message to motor nerves to initiate contraction in _____ and simultaneous relaxation of the _____ causing release of urine.	Urinary bladder CNS Smooth muscles of bladder, urethral sphincter																		
1.	DIAGRAM BASED QUESTIONS Identify the labellings in the given diagram 	<table border="1"> <tr> <td>A</td><td>Renal cortex</td></tr> <tr> <td>B</td><td>Medullary pyramid</td></tr> <tr> <td>C</td><td>Renal pelvis</td></tr> <tr> <td>D</td><td>Ureter</td></tr> <tr> <td>E</td><td>Urinary bladder</td></tr> <tr> <td>F</td><td>Urethra</td></tr> <tr> <td>G</td><td>Renal columns of Bertini</td></tr> </table>	A	Renal cortex	B	Medullary pyramid	C	Renal pelvis	D	Ureter	E	Urinary bladder	F	Urethra	G	Renal columns of Bertini				
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I	Collecting duct																			
3.	Labelled part A is the part of 	Cortex																		

4. Which type of tissue is covered the labelling part



Simple squamous

5. Identify the marked part with their tissue.



A - Proximal convoluted tubule epithelium
 B - Descending limb of loop of Henle - simple squamous
 C - Ascending limb of loop of Henle (Thin) - simple squamous epithelium
 D - Distal convoluted tubule - simple cuboidal epithelium

MATCH THE COLUMN-I WITH COLUMN-II

ANSWERS

1.

Column-I		Column-II	
(i)	Ammonotelic	(a)	Aquatic insects
		(b)	Amphibians
		(c)	Bony fishes
(ii)	Ureotelic	(d)	Marine fishes
		(e)	Aquatic amphibians
		(f)	Reptiles
(iii)	Uricotelic	(g)	Birds
		(h)	Land snails

(i) a,c,e ; (ii) b,d ; (iii) f,g,h

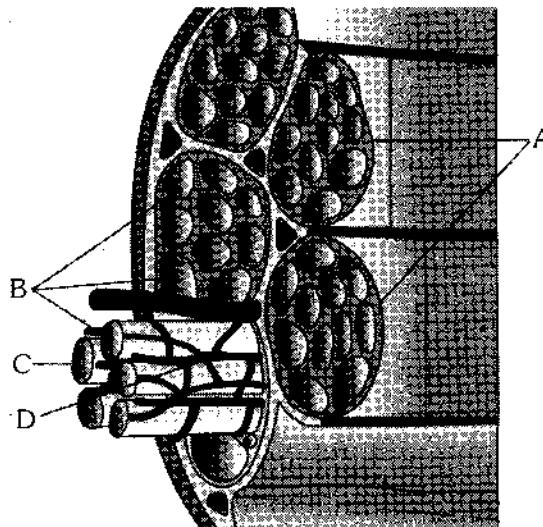
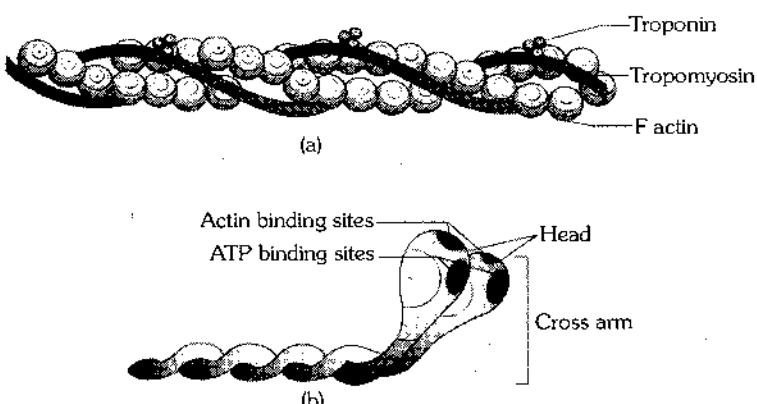
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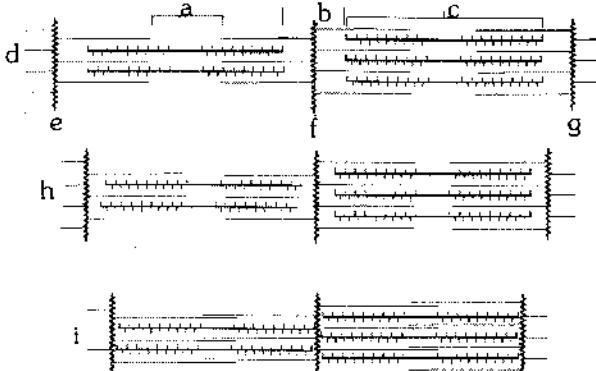
Column-I		Column-II	
(i)	Vertebrates	(a)	Flame cells
(ii)	Earthworm	(b)	Green glands
(iii)	Platyhelminthes	(c)	Malpighian tubules
(iv)	Crustaceans	(d)	Kidney
(v)	Cockroach	(e)	Nephridia

(i)-d, (ii)-e, (iii)-a, (iv)-b, (v)-c

LOCOMOTION AND MOVEMENT (MUSCLES)

Q.NO.	QUESTION	ANSWER
1.	Muscle is a specialised tissue of _____ origin	MESODERMAL
2.	Muscles have special properties like _____, _____ and _____	Excitability, contractility, elasticity
3.	Three types of muscles are	Skeletal, visceral, cardiac
4.	_____ muscles are closely associated with the skeletal components of the body.	Skeletal
5.	Skeletal muscles have a striped appearance under the microscope and hence called _____ muscles.	Striated
6.	Name the muscles which are closely related with the locomotory actions and changes in body postures.	Skeletal
7.	<u>A</u> muscles are located in the inner walls of hollow visceral organs of the body like the alimentary canal, reproductive tract etc. They do not exhibit any <u>B</u> and are in <u>C</u> appearance.	(A) visceral (B) striation (C) Smooth
8.	Smooth muscles are also called involuntary muscles. Why ?	Because these are not under the voluntary control of nervous system
9.	Name the muscles which assist in the transportation of food through the digestive tract and gametes through the genital tract.	Smooth muscles (involuntary muscles)
10.	Based on appearance cardiac muscles are _____	Striated
11.	Each organised skeletal muscle in our body is made of a number of _____ held together by a common collagenous connective tissue layer called _____	Muscle bundles or fascicles, fascia
12.	What is sarcolemma?	Plasma membrane of muscle fibre is called sarcolemma
13.	Store house of Ca^{+2} in muscle fibre is _____	Endoplasmic reticulum
14.	A characteristic feature of a muscle fibre is the presence of large number of parallel arranged filaments in the sarcoplasm called _____	Myofibrils or myofilaments
15.	Light bands of muscle fiber consist of filaments called _____ whereas dark bands consist of filaments called _____	Actin, myosin
16.	Fill in the blanks with the suitable words _____ filaments are thinner as compared to the _____ filaments , hence are commonly called _____ and _____ filaments respectively.	Actin, myosin, thin, thick
17.	In the center of each I band is an elastic fiber called _____	Z line
18.	Fill in the blanks with the suitable words _____ The thick filaments in the 'A' band are also held together in the middle of this band by a thin fibrous membrane called <u>a</u> . The 'A' and 'T' bands are arranged alternately throughout the length of the <u>b</u> . The portion of the myofibril between two successive 'Z' lines is considered as the functional unit of contraction and is called a <u>c</u> .	(a) M line (b) myofibrils (c) sarcomere

19.	Fill in the blanks with the suitable words Each actin (thin) filament is made of two 'F' (filamentous) actins <u>a</u> wound to each other. Each 'F' actin is a polymer of <u>b</u> actins. Two filaments of another protein <u>c</u> also run close to the 'F' actins throughout its length. A complex protein <u>d</u> is distributed at regular intervals on the tropomyosin. In the resting state a subunit of troponin masks the active binding sites for <u>e</u> on the <u>c</u> filaments	(a) Helically (b) monomeric G (globular) (c) tropomyosin (d) troponin (e) myosin (f) actin
20.	Name the two important parts of meromyosin	Globular head with a short arm and a tail
21.	Label A , B ,C and D in the given diagram	(A) fascicle (B) muscle fibre (C) sarcolemma (D) blood capillary
		
22.	Identify the given diagrams	(a) an actin filament (b) myosin monomer (meromyosin)
		
23.	Mechanism of muscle contraction is best explained by _____	Sliding filament theory
24.	Give only the statement of sliding filament theory	Contraction of a muscle fiber takes place by the sliding of the thin filaments over the thick filaments

25.	Complete the labellings of the following diagram		(a) H zone (b) I band (c) A band (d) relaxed (e) Z line (f) Z line (g) Z line (h) contracting (i) maximum contracted																													
26.	Store house of Calcium ions for muscle contraction is _____	Sarcoplasmic reticulum																														
27.	What type of movement is seen in Amoeba ?	Streaming movement of protoplasm																														
28.	Cells of the human body exhibit three main types of movements _____, _____ and _____.	Amoeboid, ciliary, muscular																														
29.	About _____ percent of the body weight of a human adult is contributed by muscles.	40-50																														
30.	Match the column -	a-iii-1, 2, b-i-3, c-ii-4																														
	<table border="1"> <thead> <tr> <th colspan="2">Column A</th> <th colspan="2">Column B</th> <th colspan="2">Column C</th> </tr> </thead> <tbody> <tr> <td>a</td> <td>Striped muscles</td> <td>i</td> <td>Located in the inner walls of hollow visceral organs of the body</td> <td>1</td> <td>Involved in locomotory actions</td> </tr> <tr> <td>b</td> <td>Visceral muscles</td> <td>ii</td> <td>Muscles of heart</td> <td>2</td> <td>Changes of body posture</td> </tr> <tr> <td>c</td> <td>Cardiac muscles</td> <td>iii</td> <td>Closely associated with the skeletal components of the body</td> <td>3</td> <td>Transportation of food</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>4</td> <td>Contraction and relaxation of heart</td> </tr> </tbody> </table>	Column A		Column B		Column C		a	Striped muscles	i	Located in the inner walls of hollow visceral organs of the body	1	Involved in locomotory actions	b	Visceral muscles	ii	Muscles of heart	2	Changes of body posture	c	Cardiac muscles	iii	Closely associated with the skeletal components of the body	3	Transportation of food					4	Contraction and relaxation of heart	
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31.	Muscle fibre is a _____ as the sarcoplasm contains many nuclei.	Syncytium																														
32.	Name the two important proteins due to which striated appearance is seen in myofibril	Actin, myosin																														
33.	Name the protein found in isotropic and anisotropic bands of myofibrils	Actin, myosin																														

34.	The main source of energy during muscle contraction is _____	Glycogen
35.	Dark bands of myofibrils are known as _____ band.	Anisotropic
36.	Muscle contraction is initiated by a signal sent by the _____	Central nervous system
37.	The functional unit of the contractile system in the striped muscle is _____	Sarcomere
38.	Contraction of a muscle is caused by -	Actomyosin
39.	During muscle contraction (a) energy is converted into (b) energy	(a) chemical (b) mechanical
40.	The distance or length of the myofibril between two adjacent z-bands is called	Sarcomere
41.	In a relaxed fibril, H-zone, a lighter region of low density can be seen in the centre of _____.	A-band

LOCOMOTION AND MOVEMENT (SKELETAL SYSTEM)

Q.NO.	QUESTION	ANSWER
1.	Skeletal system consist of a framework of _____ and a few _____	Bones , cartilages
2.	How many bones are found in axial skeleton?	80
3.	Axial skeleton consist of _____ bones distributed _____	80, along the main axis of the body
4.	The skull , vertebral column and ribs constitute the _____ skeleton	Axial
5.	The skull consist of _____ sets of bones _____ and _____	Two, cranial , facial
6.	How many bones are found in human cranium?	8
7.	Name the U shaped bone present at the base of the skull.	Hyoid
8.	Each middle ear consist of three tiny bones - _____, _____ and _____ collectively called _____	Malleus, incus, stapes, ear ossicles
9.	The skull region articulates with the superior region of the vertebral column with the help of two _____	Occipital condyles
10.	Type of skull found in human beings is _____	Dicondylic
11.	How many bones are found in human vertebral column ?	26
12.	First vertebrae is _____	Atlas
13.	Name the central hollow portion in vertebrae through which the spinal cord passes.	Neural canal
14.	The number of cervical vertebrae are _____ in almost all mammals including human beings.	Seven
15.	_____ is a flat bone on the midventral line of the thorax	Sternum
16.	Write the functions of the vertebral column	Protection of spinal cord, support the head, serves as point of attachment for the ribs and musculature of the back
17.	Ribs are dorsally attached with _____ whereas ventrally with _____	Vertebral column , sternum
18.	Each forelimb consist of _____ bones	30
19.	The bones of the limbs along with their girdles constitute the _____	Appendicular skeleton
20.	Longest and strongest bone of the human body is	Femur
21.	A cup shaped bone called _____ cover the knee ventrally	patella
22.	Each half of pectoral girdle consist of a _____ and a _____	Clavicle, scapula
23.	Name the type of joint between the following :- (a) atlas/axis (b) carpal/metacarpal of thumb (c) between phalanges (d) femur/acetabulum (e) between cranial bones (f) between pubic bones in the pelvic girdle	(a) pivot (b) saddle (c) hinge (d) ball and socket (e) sutures (f) pubis symphysis

24.	<p>Fill in the blank spaces :</p> <p>(a) All mammals (except a few) have _____ cervical vertebra.</p> <p>(b) The number of phalanges in each limb of human a _____</p> <p>(c) _____ and _____ pairs of ribs are called floating ribs.</p> <p>(d) The human cranium is made of _____ bones.</p>	<p>(a) seven (b) 14 (c) 11th, 12th (d) 8</p>																								
25.	<p>Write true or false.</p> <p>(a) Arthritis is inflammation of joints</p> <p>(b) Osteoporosis is a age related disorder characterized by decreased bone mass and increased chances of fractures.</p> <p>(c) Gout is the inflammation of joints due to accumulation of calcium carbonate crystals</p>	<p>(a) true (b) true (c) false</p>																								
26.	Name the age related disorder characterized by decreased bone mass and increased chances of fractures.	Osteoporosis																								
27.	In joints, the bones involved are joined together with the help of cartilages. The joint between the adjacent vertebrae in the vertebral column is of this pattern and it permits limited movements, is –	Cartilagenous																								
28.	_____ joints are characterised by the presence of a fluid filled synovial cavity between the articulating surfaces of the two bones.	Synovial																								
29.	<p>Match the following bones of vertebral column</p> <table border="1"> <thead> <tr> <th colspan="2">NAME</th> <th colspan="2">NUMBER</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>CERVICAL</td> <td>I</td> <td>7</td> </tr> <tr> <td>B</td> <td>THORACIC</td> <td>II</td> <td>12</td> </tr> <tr> <td>C</td> <td>LUMBAR</td> <td>III</td> <td>5</td> </tr> <tr> <td>D</td> <td>SACRAL</td> <td>IV</td> <td>(5)</td> </tr> <tr> <td>E</td> <td>COCCYX</td> <td>V</td> <td>(4)</td> </tr> </tbody> </table>	NAME		NUMBER		A	CERVICAL	I	7	B	THORACIC	II	12	C	LUMBAR	III	5	D	SACRAL	IV	(5)	E	COCCYX	V	(4)	A-I, B-II, C-III, D-IV, E-V
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32.

Match the following bones of hindlimbs

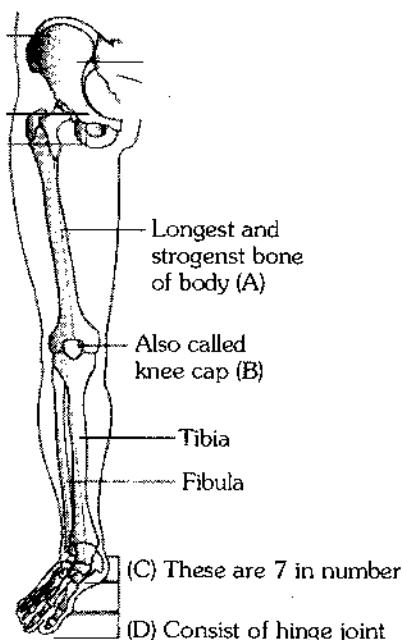
A-IV, B-II, C-III, D-I

NAME		NUMBER	
A	Femur	I	14
B	Tarsals	II	7
C	Metatarsals	III	5
D	Phalanges	IV	1

33.

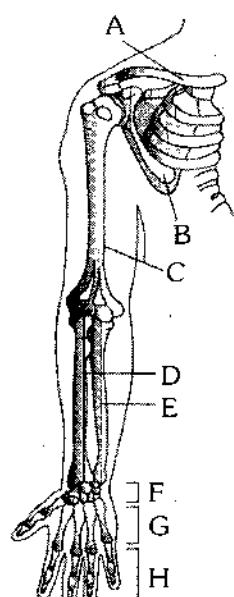
Identify A, B, C and D in the given diagram

- (A) Femur
- (B) Patella
- (C) Tarsals
- (D) Phalanges

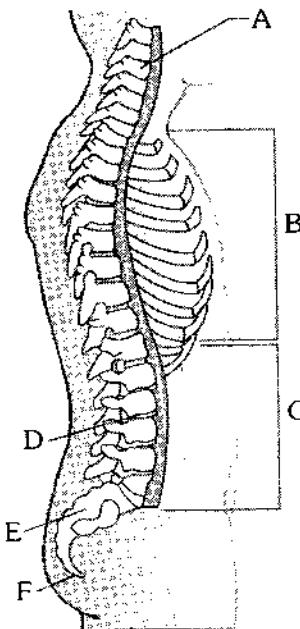

34.

Label A, B, C, D, E, F, G and H in the given diagram of forelimb

- (A) clavicle
- (B) scapula
- (C) humerus
- (D) radius
- (E) ulna
- (F) carpal
- (G) metacarpals
- (H) phalanges



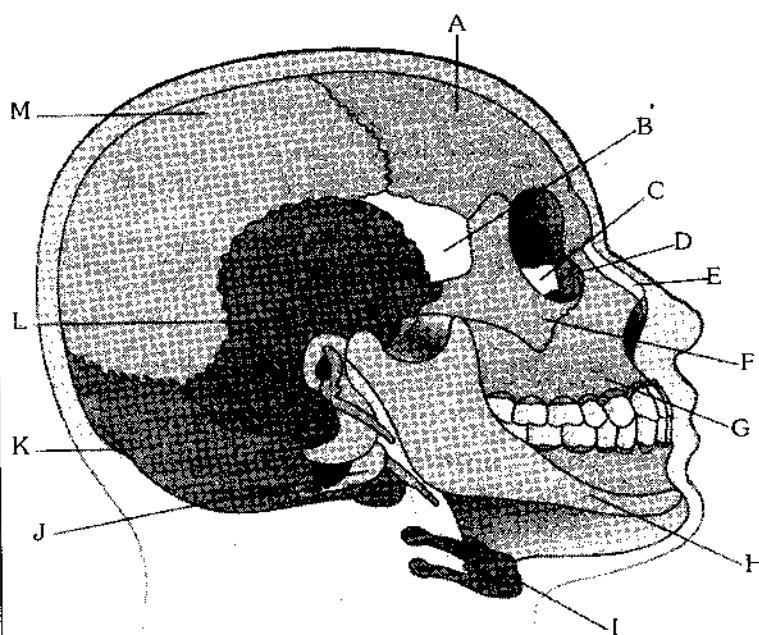
35.



A	Cervical vertebrae
B	Thoracic vertebrae
C	Lumbar vertebrae
D	Intervertebral disc
E	Sacrum
F	coccyx

Identify the labelling A , B , C , D , E and F in the given diagram of vertebral column

36.



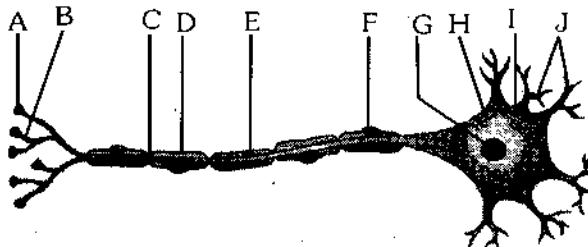
A	Frontal bone
B	Sphenoid bone
C	Ethmoid bone
D	Lacrimal bone
E	Nasal bone
F	Zygomatic bone
G	Maxilla
H	Mandible
I	Hyoid bone
J	Occipital condyle
K	Occipital bone
L	Temporal bone
M	Parietal bone

Identify A , B , C , D , E , F , G , H , I , J , K , L and M in the given diagram of skull.

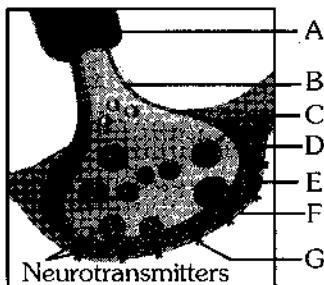
NEURAL CONTROL AND COORDINATION

Q.NO.	QUESTIONS	ANSWERS												
1.	Process through two or more organ interact and compliment the function of each other is	Coordination												
2.	Other system from which nervous system coordinate & integrate in synchronised fashion is :-	Endocrine system												
3.	Organised network of neural system, which provides quick coordination through	Point to point connections												
4.	Highly specialised cells in animals which can detect, receive & transmit different kinds of stimuli	Neurons												
5.	Lower vertebrate in which neural organisation is very simple & composed of network of neurons is	Hydra												
6.	Site where all the information are processed & controlled is	CNS												
7.	Part of PNS which carries impulses from tissue/organ to CNS are	Afferent fibres												
8.	Neural system which relays impulses from CNS to skeletal muscle is	Somatic neural system												
9.	Branch of PNS which transmit impulses from CNS to involuntary organ and classified into sympathetic & parasympathetic neural system is	(A.N.S) Autonomic neural system												
10.	Bulb like structure where branch of nerve fibre terminates	Synaptic knob												
11.	Chemicals by which nerve impulses transmit through one neuron to another are	Neuro transmitters												
12.	Cells which envelop nerve fibres and form myelin sheath around the axon are	Schwann cells												
13.	Gap between two adjacent myelin sheath are known as	Node of Ranvier												
14.	Myelinated and unmyelinated nerve fibres are found in PNS respectively are	Cranial/Spinal nerve and Autonomic & somatic nerve fibres												
15.	Property of excitability of neuron is due to	Polarised state of membrane of neuron												
16.	At resting stage permeability of K^+ ion is more comparatively Na^+ ion through axonal membrane	True												
17.	<table border="1"> <thead> <tr> <th>Type of Neuron</th> <th colspan="2">Source</th> </tr> </thead> <tbody> <tr> <td>(a) Multipolar</td> <td>(i)</td> <td>Embryonic stage</td> </tr> <tr> <td>(b) Bipolar</td> <td>(ii)</td> <td>Cerebral cortex</td> </tr> <tr> <td>(c) Unipolar</td> <td>(iii)</td> <td>Retina of eye</td> </tr> </tbody> </table> (1) a-i, b-iii, c-ii (3) a-ii, b-iii, c-i	Type of Neuron	Source		(a) Multipolar	(i)	Embryonic stage	(b) Bipolar	(ii)	Cerebral cortex	(c) Unipolar	(iii)	Retina of eye	a-ii, b-iii, c-i (2) a-iii, b-ii, c-i (4) a-ii, b-i, c-iii
Type of Neuron	Source													
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(c) Unipolar	(iii)	Retina of eye												

18.	At resting stage charge of inner surface is due to presence of	More K^+ Ion & negatively charged protein molecule
19.	Concentration gradient of axoplasm at resting stage is maintained by	$Na^+ - K^+$ pump
20.	When a stimulus is applied on axonal membrane then generation of action potential is due to	Change permeability for Na^+ Ion
21.	Generation of action potential in stage of	Exciting stage
22.	Junctions from which impulse is transmitted through one neuron to another are known as	Synapse
23.	Type of synapse in which transmission of impulse across neuron is similar to conduction along a single axon	Electrical synapse
24.	Inside the skull the brain is covered by some membrane are called as	Meninges
25.	Deep cleft which divides cerebrum longitudinally into two halves, known as	Median fissure
26.	Tract of nerve fibre which connects both cerebral hemisphere is	Corpus callosum
27.	The portion of cerebrum which is greyish in appearance is	Cerebral cortex
28.	Region of cerebral cortex which is neither motor nor sensory is	Association area
29.	Major coordinating centre of fore brain which is wrapped around by cerebrum and responsible for motor & sensory signaling is	Thalamus
30.	Important part of fore brain which controls body temperature, urge for eating & drinking and has several groups of neurosecretory cells is	Hypothalamus
31.	Inner part of cerebral hemisphere, which is involved in sexual behavior, motivation, expression of emotional reactions etc. and a group of associated deep structures like amygdala, hippocampus etc. is	Limbic system
32.	Canal of mid brain which connects forebrain & hindbrain is	Cerebral aqueduct
33.	Round swelling at the dorsal portion of the midbrain is known as	Quadrigemina
34.	Involuntary response process which requires involvement of C.N.S without conscious effort is	Reflex action
35.	The reflex pathway requires at least	One afferent & one efferent neuron
36.	Layer of eye ball, which contains many blood vessels and bluish in colour is	Choroid
37.	Anterior part of choroid layer which holds lens by ligaments is	Ciliary body
38.	Regulating muscle, which controls the pupil is a part of	Iris
39.	Innermost layer of retina which is situated towards vitreous chamber is	Ganglionic layer
40.	Outermost layer of retina which holds sensory neurons like rods & cones is	Photoreceptor layer

41.	The daylight/photopic or color vision and twilight/scotopic vision are function of respectively	Cones & Rods
42.	Vitamin which is required for formation of rodopsin or visual purple is	Vitamin A
43.	Types of cones which posses their own characteristic photo pigments are	Red, green & blue lights
44.	Point at posterior pole, which is medial to and slightly above the posterior pole from where optic nerve leave is	Blind spot
45.	Central pit of yellowish pigmented macula lutea is	Fovea
46.	Densely packed portion of macula lutea where visual activity is greatest is	Fovea
47.	Space called vitreous chamber filled with transparent gel like substance found in between	Lens & retina
48.	Photosensitive compound in the human eye which is composed of a protein and an aldehyde of vitamin A is respectively	Opsin & retinal
49.	Generation of action potential concern with which layer of retina	Ganglionic layer
50.	Sensory functions which are considered for ear are	Hearing & maintenance of body
51.	Middle ear which contain three ossicles in key chain like fashion are namely	Malleus, incus and stapes
52.	Ossicle which is attached with the oval window of the cochlea is	Stapes
53.	Middle ear cavity connected to pharynx through	Eustachian tube
54.	Series of channels, formed of by bones are filled with	Perilymph
55.	Coiled portion of membranous labyrinth is filled with	Endolymph
56.	Upper part of bony labyrinth filled by perilymph & separated by reissner's membrane from cochlea is	Scala Vestibuli
57.	Scala vestibuli & scala tympani ends at the windows respectively	Oval & Round window
58.	Hearing apparatus located on basilar membrane is	Organ of corti
59.	Vestibular apparatus related with body balance is consist of	Semi-circular canal & otolith organ
60.	Given below is a structure of a neuron label the parts from A to J	<p>(A) Synaptic knob (B) Axon terminal (C) Node of Ranvier (D) Myelin sheath (E) Axon (F) Schwann cell (G) Nucleus (H) Cell body (I) Nissl's granules (J) Dendrites</p> 

61. Label the parts in the given diagram of axon terminal and synapse



- (A) Axon
- (B) Axon terminal
- (C) Synaptic vesicles
- (D) Pre-synaptic membrane
- (E) Synaptic cleft
- (F) Post-synaptic membrane
- (G) Receptors

62. Which part of the ear determines the pitch of a sound?

Cochlea

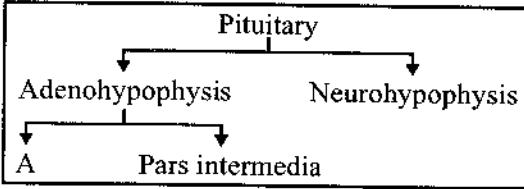
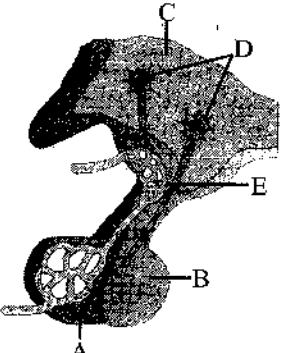
63. Which part of human brain is most developed?

Cerebrum

64. Which part of our central nervous system acts as a master clock?

Hypothalamus

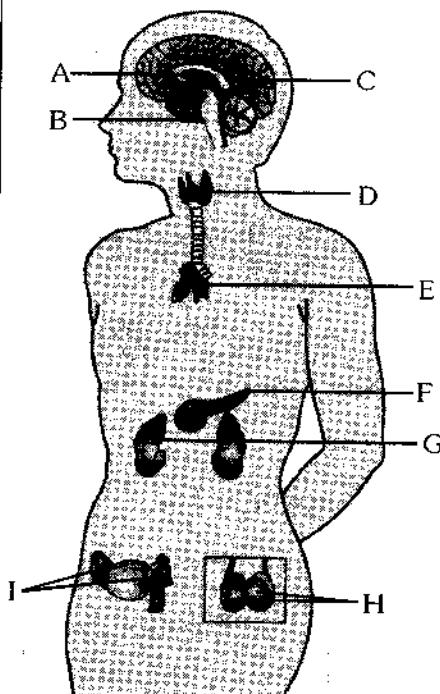
CHEMICAL COORDINATION & INTEGRATION

Q.NO.	QUESTIONS	ANSWERS
1.	Chemical which are non-nutrient and act as inter cellular messengers are known as	Hormone
2.	Tissues located in different parts of body like pituitary, pineal, thyroid etc are known as	Organised endocrine glands
3.	Group of neurosecretory cells which produces hormones and are located in hypothalamus are known as	Nuclei
4.	Hormone which is responsible to inhibit the release of growth hormone from pituitary is	Somatostatin
5.	Anterior pituitary & posterior pituitary hormones are regulated by hypothalamus respectively through	Portal circulatory system & direct neural regulation
6.	Bony cavity in which pituitary gland is situated in	Sella turcica
7.	 <p>'A' is the portion of adenohypophysis which secretes different hormones 'A' is _____</p>	Pars distalis
8.	Apart from humans melanocyte stimulating hormone is secreted through	Pars intermedia
9.	Hormone which are released from posterior pituitary are	Oxytocin and vasopressin
10.	Over secretion and low secretion of GH at childhood leads to respectively.	Gigantism and pituitary dwarfism
11.	Hormone secreted by pituitary gland and regulates the mammary gland and formation of milk in them is	Prolactin
12.	In females, vigorous contraction of uterus at the time of child birth and milk ejection from the mammary gland is due to	Oxytocin
13.	Hormone responsible for reabsorption of water and electrolyte to reduce loss of water is	Antidiuretic hormone (ADH)
14.	Identify A, B, C and D, E	<p>A—Anterior pituitary B—Posterior pituitary C—Hypothalamus D—Hypothalamic neuron E—Portal circulation</p> 

15.	Gland which is responsible for rhythms of sleep wake cycle	Pineal gland
16.	Deficiency of I_2 in diet leads to	Goiter
17.	Stunted growth of child during pregnancy mental retardation, low intelligence quotient is due to	Hypo thyrodisim
18.	Hormone responsible for basal metabolic rate is	Thyroxine
19.	Hormone, responsible for raised level of Ca^{+2} in blood is	PTH
20.	Antagonist pair of hormone which regulate Ca^{+2} in blood are	PTH and TCT
21.	Hormone which play a major role in differentiation in T-Lymphocyte is	Thymosin
22.	Catecholamine which are secreted in emergency conditions are	Adrenaline and noradrenaline
23.	Main glucocorticoid hormone responsible for carbohydrate metabolism is	Cortisol
24.	Hormone which inhibit cellular uptake and utilisation of amino acid as well as does hyperglycemia through gluconeogenesis is	Cortisol
25.	Hormone of adrenal cortex which helps in maintaining electrolyte and body fluid volume is	Aldosterone
26.	Hormone which enhance cellular uptake and utilisation of glucose as well as does hypoglycemia through glucogenesis is	Insulin
27.	Male and female sex hormone respectively which stimulate development of sex organ, sexual behaviour, gametogenesis are	Testosteron and estrogen
28.	Chemical nature of all the hormone which are secreted from pituitary and hypothalamus is	Proteinous
29.	Ca^{+2} , IP_3 , C-AMP etc. are generated after binding of hormone on receptor present on membrane thus these are termed as	Secondary messenger
30.	Hormone which regulate gene expression or chromosome by interaction of hormone receptor complex with the genome are	Steroid and Iodothyronin hormone
31.	Endocrine glands lack ducts and are hence, called _____ glands and their secretions are called _____	Ductless, hormones
32.	_____ possess very simple endocrine systems with few hormones whereas a large number of chemicals act as hormones and provide coordination in the _____	Invertebrates, vertebrates
33.	Hypothalamus is the basal part of _____	diencephalon
34.	Name the hypothalamic hormone which stimulates the pituitary synthesis and release of gonadotrophins	Gonadotrophic releasing hormone

35.

Label A, B, C, D, E, F, G, H and I is the given diagram of location of endocrine glands



(A) Hypothalamus

(B) Pituitary

(C) Pineal

(D) Thyroid and parathyroid

(E) Thymus

(F) Pancreas

(G) Adrenal

(H) Testis

(I) Ovary

36.

Name the hormone which stimulates the synthesis and secretion of thyroid hormones from the thyroid gland.

Thyroid stimulating hormone (TSH)

37.

LH and FSH are called gonadotrophins. Why?

Because they stimulates the gonadal activity

38.

Name the hormone which stimulates the synthesis and secretion of androgens from testis.

LH (Luteinsing hormone)

39.

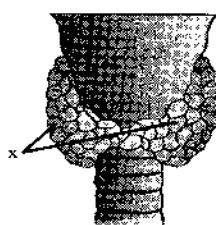
What is the function of LH in females?

LH in females induces ovulation of fully mature follicles and maintains the corpus luteum

40.

Name the hormone secreted by pars intermedia and its function.

Melanocyte stimulating hormone, regulates pigmentation of the skin

41.


(A) Name the gland shown in the diagram

(A) Thyroid

(B) Name the hormones secreted by this gland

(B) Thyroxine, tri-iodothyronine

(C) Which element is essential for the normal rate of hormone synthesis in this gland?

(C) Iodine

42.	In adult women, _____ may cause menstrual cycle to become irregular	Hypothyroidism																				
43.	I am a lobular structure located between lungs behind sternum on the ventral side of aorta and plays an important role in the development of the immune system. Identify me.	Thymus gland																				
44.	Adrenaline and noradrenaline are called emergency hormones. Why?	Because these are secreted in response of any kind of stress and during emergency conditions.																				
45.	The adrenal cortex can be divided into three layers, called _____ (inner layer), _____ (middle layer) and _____ (outer layer)	Zona reticularis, zona fasciculata, zona glomerulosa																				
46.	Name the main mineralocorticoid in our body.	aldosterone																				
47.	Endocrine part of pancreas is called _____	islets of Langerhans																				
48.	Alpha cells of islets of Langerhans secrete _____	glucagon																				
49.	Beta cells of islets of Langerhans secrete _____	insulin																				
50.	Write some symptoms of diabetes mellitus.	Glycosuria (loss of glucose through urine), ketonuria (loss of ketone bodies through urine)																				
51.	Name the hormone secreted by atria of heart which causes dilation of blood vessels and reduces blood pressure.	ANF (Atrial Natri Uretic Factor)																				
52.	The _____ of kidney produce a peptide hormone called _____ which stimulates _____.	Juxta glomerular cells, erythropoietin, erythropoiesis																				
53.	Name the hormone which increases the secretion of pepsinogen and hydrochloric acid from gastric glands.	Gastrin																				
54.	Which hormonal deficiency is responsible for the following ? (a) Diabetes mellitus (b) Goitre (c) Cretinism	(a) insulin (b) iodine (c) thyroxine																				
55.	Match the following columns	(a) ii (b) iv (c) i (d) iii																				
	<table border="1"> <thead> <tr> <th></th> <th>Column(A)</th> <th></th> <th>Column(B)</th> </tr> </thead> <tbody> <tr> <td>a</td> <td>T4</td> <td>i</td> <td>Hypothalamus</td> </tr> <tr> <td>b</td> <td>PTH</td> <td>ii</td> <td>Thyroid</td> </tr> <tr> <td>c</td> <td>GnRH</td> <td>iii</td> <td>Pituitary</td> </tr> <tr> <td>d</td> <td>LH</td> <td>iv</td> <td>Parathyroid</td> </tr> </tbody> </table>		Column(A)		Column(B)	a	T4	i	Hypothalamus	b	PTH	ii	Thyroid	c	GnRH	iii	Pituitary	d	LH	iv	Parathyroid	
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a	T4	i	Hypothalamus																			
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56.	Fill in the blanks Hormones (a) Hypothalamic hormones (b) Thyrotrophin (TSH) (c) Corticotrophin (ACTH) (d) Gonadotrophins (LH, FSH) (e) Metanotrophin (MSH)	Targest gland <hr/> <hr/> <hr/> <hr/> <hr/>	(a) pituitary gland (b) thyroid gland (c) adrenal cortex (d) gonads (e) melanocytes (melanin secreting cells)																			